BOILERS
and
STEEL SPECIALTIES

Wm BROS BOILER & MFG. COMPANY
MINNEAPOLIS • MINNESOTA

foreword

FOR forty-six years the Wm. Bros Boiler & Mfg. Company have been actively engaged in the manufacture of Boilers, Tanks, Smokestacks and Steel Equipment of all types of construction.

Forty-six years of experience and experimentation have placed this Company in a strong position, not only as a competent manufacturer and fabricator of steel products, but also in an advisory and designing capacity. The same sound policies of these many years, which have won for this Company recognition as the leading steel specialties fabricator of the Northwest, are still in practice today.

It is the earnest desire and endeavor of the entire Wm. Bros Boiler & Mfg. Company organization to give the public the best designed and best built products at the lowest possible cost. BROS Products are known throughout the Northwest for their quality and durability.

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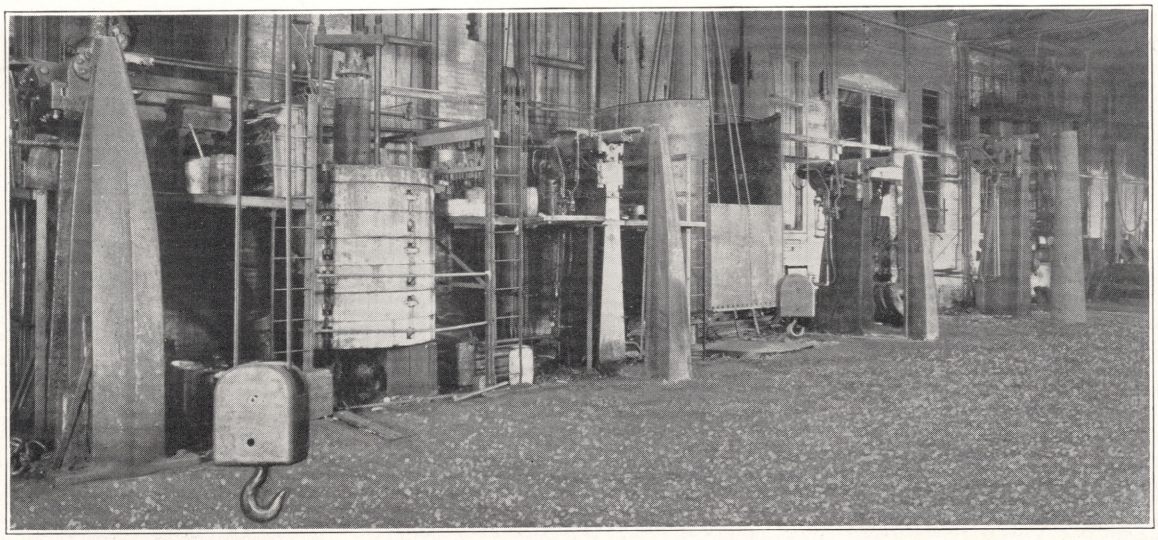
Nicollet Island Plant

East Hennepin Plant

Hydraulic Flanging Department

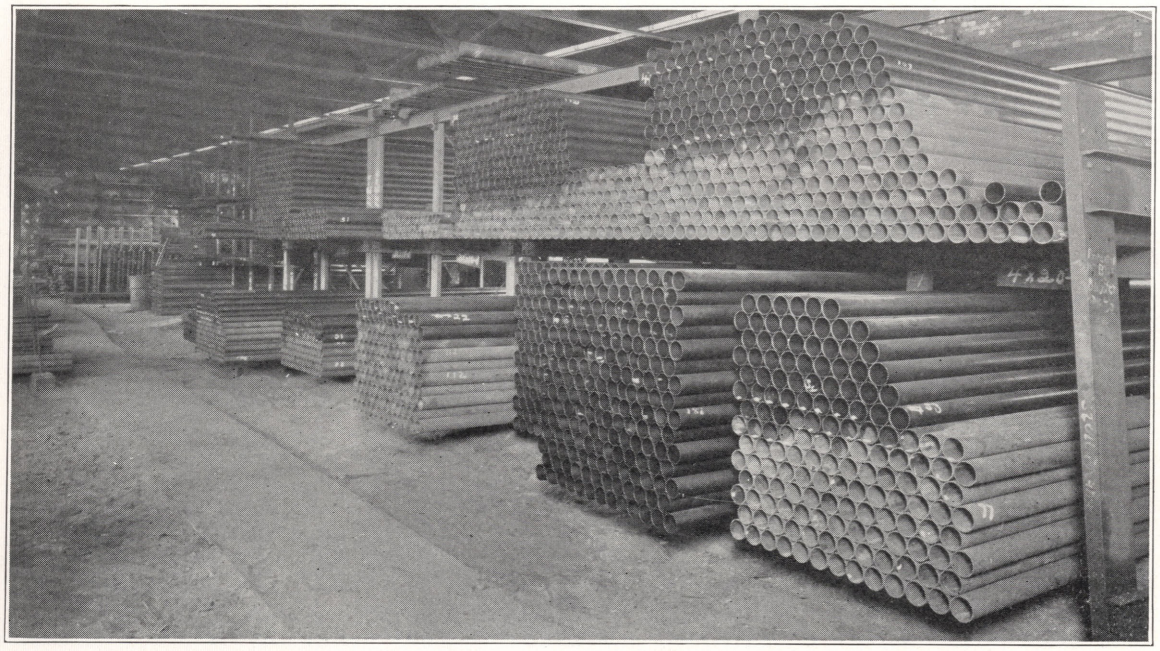
Flanging Department consists of two four column 350 ton presses, one 150 ton sectional press and one 12 foot brake press.

Hydraulic Riveting Department



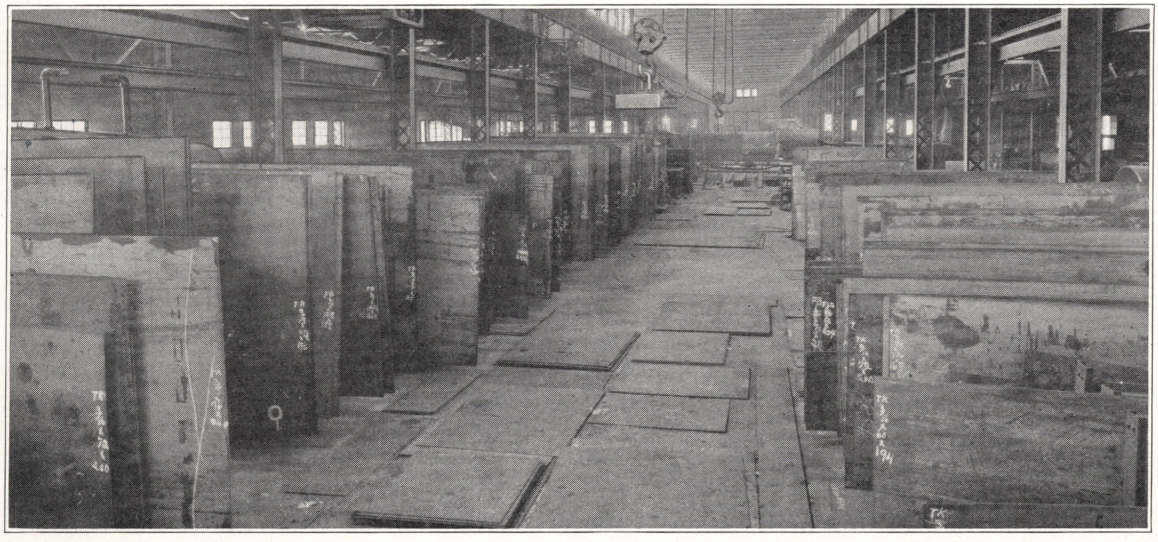
Riveting Department is composed of one 105 ton riveter, one 85 ton riveter and two 50 ton riveters.

Tube Department



Seamless drawn tubes of all diameters and lengths are carried for immediate shipments.

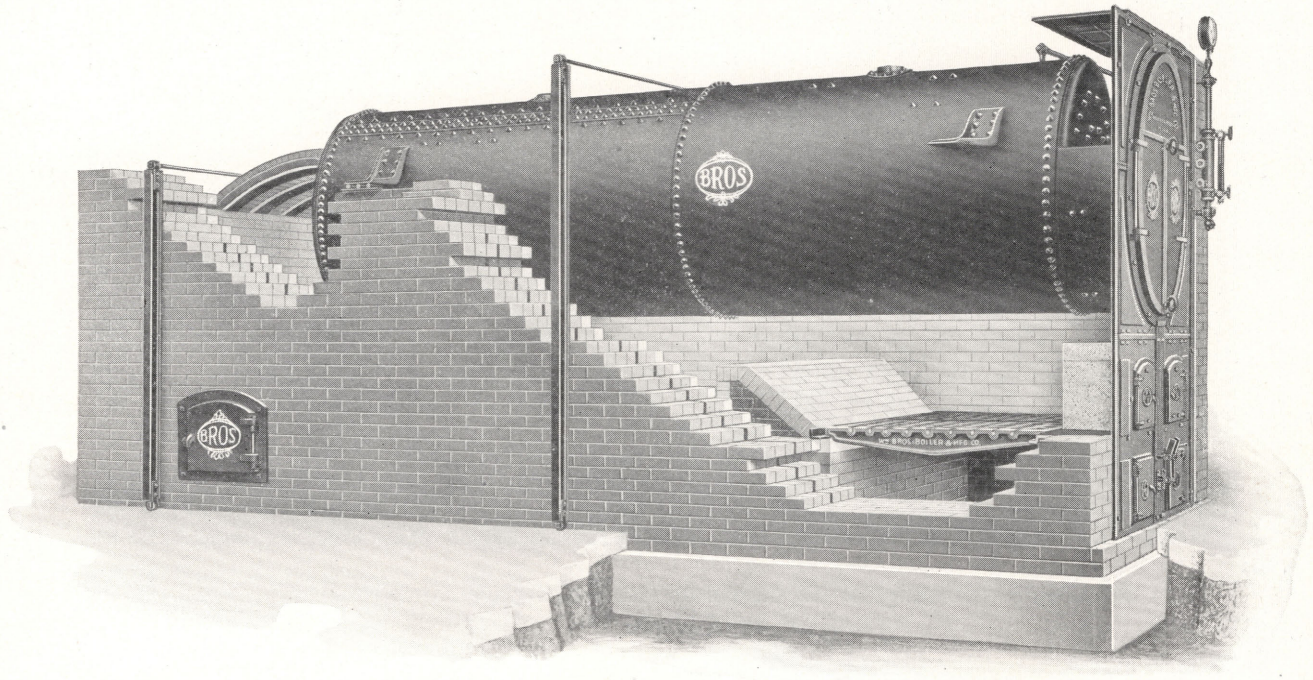
Plate Department



Firebox, flange, and tank steel of all sizes and thickness of material are stocked for rush shipments.

Low Pressure Horizontal Tubular Boiler

Working Pressure 100 Pounds



PRICE LIST

Horse Power A. S. M. E.	17	20	20	25	30	35	40	45	50	55	60	70	75	90	100	110	120	140	155
Dimensions	30x8	30x10	36x8	36x10	36x12	42x10	42x12	42x14	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18
Bare Boiler and Extension	$370	$420	$440	$500	$560	$700	$770	$850	$940	$960	$1060	$1250	$1400	$1650	$1860	$2080	$2220	$2530	$2800
‡Full Front	96	96	112	112	112	140	140	140	240	240	240	270	270	290	290	335	335	370	370
Grates, Stationary	22	22	37	37	46	46	55	60	60	70	70	80	90	100	110	110	122	122	135
†Firedoor Arches	11	11	11	11	11	13	13	13	40	40	40	40	40	40	40	40	40	50	50
Return Plate or "C" Ribs	9	9	10	10	10	16	16	16	21	21	21	25	25	25	25	30	30	35	35
Clean Out Door and Frame	12	12	12	12	12	12	12	12	17	17	17	17	17	17	17	20	20	20	20
Back Bearing Bar	2	2	3	3	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6
Wall Plates and Rollers	8	8	8	8	8	10	10	10	12	12	12	12	12	16	16	16	16	16	16
Rear Wall Braces and Thru Rods	14	14	18	18	18	18	18	18	22	22	22	22	22	24	24	24	24	40	40
Steel Buck Bars and Cross Rods	15	15	15	15	15	15	15	15	30	30	30	30	30	34	34	37	37	47	47
Steam Trimmings	50	50	50	55	55	60	60	60	85	85	85	85	85	100	100	120	120	130	130
Total	$609	$659	$716	$781	$850	$1033	$1112	$1197	$1471	$1501	$1601	$1835	$1995	$2311	$2521	$2817	$2969	$3366	$3649

EXTRAS, ADD TO ABOVE

BROS Rocking Grates	$25	$25	$36	$36	$42	$42	$49	$56	$56	$64	$64	$72	$81	$90	$100	$100	$110	$110	$120
Fire Tools	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Smoke Stack and Guys	80	85	85	120	130	120	130	150	140	180	200	190	216	290	290	310	310	320	320
*Suspension	....	....	....	....	....	110	110	110	130	130	130	150	150	200	200	260	250	260	260
Balanced Draft Door, per door	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

‡Full front includes doors, front bearing bar, damper and damper frame.
*Suspension consists of four columns, two cross beams, foot and cap plates, suspension bolts and washers complete for one boiler.
†Cast iron, 30 to 42 inch boilers; 48-inch and larger, either tile or cast iron.

Low Pressure Horizontal Tubular Boiler

Working Pressure 100 Pounds

SPECIFICATIONS

Horse Power A. S. M. E.	17	20	20	25	30	35	40	45	50	55	60	70	75	90	100	110	120	140	155
Dimensions	30x8	30x10	36x8	36x10	36x12	42x10	42x12	42x14	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18
Shell Heating Surface	41	48	50	63	75	74	86	98	101	117	133	132	151	168	189	184	207	201	226
3″ Tubes — Number	**20**	**20**	**24**	**24**	**24**	**34**	**34**	**34**	**46**	46	....	....	....	....	....	....	....	....	....
3″ Tubes — Tube Heating Surface	**126**	**157**	**151**	**189**	**226**	**271**	**321**	**373**	**434**	506	....	....	....	....	....	....	....	....	....
3″ Tubes — Total Heating Surface	**167**	**205**	**201**	**252**	**301**	**345**	**407**	**471**	**535**	623	....	....	....	....	....	....	....	....	....
3″ Tubes — Steam Radiation, Sq. Ft.	**1200**	**1500**	**1500**	**1900**	**2200**	**2600**	3100	**3600**	**4100**	4800	....	....	....	....	....	....	....	....	....
3½″ Tubes — Number	....	....	....	....	....	....	....	....	34	**34**	34	**44**	44	54	54	66	66	**86**	**70**
3½″ Tubes — Tube Heating Surface	....	....	....	....	....	....	....	....	374	**436**	498	**564**	645	792	891	968	1089	1261	1418
3½″ Tubes — Total Heating Surface	....	....	....	....	....	....	....	....	475	**553**	631	**696**	796	960	1080	1152	1296	1462	1644
3½″ Tubes — Steam Radiation, Sq. Ft.	....	....	....	....	....	....	....	....	3600	**4300**	4900	**5500**	6300	7800	9000	10000	12000	14000	15000
4″ Tubes — Number	....	....	....	....	....	....	....	....	....	28	**28**	36	**36**	**44**	**44**	**54**	**54**	**70**	**70**
4″ Tubes — Tube Heating Surface	....	....	....	....	....	....	....	....	....	411	**470**	528	**603**	**737**	**829**	**905**	**1018**	**1173**	**1320**
4″ Tubes — Total Heating Surface	....	....	....	....	....	....	....	....	....	528	**603**	660	**754**	**905**	**1018**	**1089**	**1225**	**1374**	**1546**
4″ Tubes — Steam Radiation, Sq. Ft.	....	....	....	....	....	....	....	....	....	4100	**4700**	5200	**6000**	**7400**	**8500**	**9200**	**11000**	**13000**	**15000**
Thickness Shell	¼	¼	¼	¼	¼	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	3/8	3/8	3/8	3/8	7/16	7/16
Thickness Heads	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	7/16	7/16	7/16	7/16	7/16	½	½	½	½	9/16	9/16
Steam Opening, front, Inches	4	4	4	4	4	5	5	5	6	6	6	6	6	6	6	6	6	6	6
Safety Valve Opening, rear, Inches	2	2	2½	2½	2½	2½	2½	3	4	4	4	5	5	6	6	6	6	6	6
Blow-Off Opening, Inches	2	2	2	2	2	2	2	2	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½
Blow-Off Valve, Inches	2	2	2	2	2	2	2	2	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½
Water Column Connections, Inches	1	1	1	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Pop Safety Valve, for 100 lbs., Inches	1	1	1	1¼	1½	1½	2	2	2–1¼	2–1½	2–1½	2–1½	2–1½	2–2	2–2	2–2	2–2½	2–2½	2–2½
Water Gauge, Inches	½	½	½	½	½	½	½	½	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Steam Gauge, Inches	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	8½	8½	8½	8½
Gauge Cocks	½	½	½	½	½	½	½	½	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Check and Stop Valves	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	1½	1½
Stack Gauge	16	16	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14
Stack One Boiler	14x30	14x35	16x30	16x35	16x40	20x35	20x40	20x50	24x40	24x50	24x60	26x50	26x60	28x60	28x60	30x60	30x60	34x60	34x70
Grates—Size, Inches	30x30	30x30	36x36	36x36	36x42	42x36	42x42	42x48	48x42	48x48	48x48	54x48	54x54	60x54	60x60	66x54	66x60	72x54	72x60

Boilers with tube setting in heavy type are our standard and always furnished this way, unless otherwise specified.

Fronts:—Boilers 42 inches diameter and smaller have single fire and ash doors; larger, two fire and two ash doors.

Manholes:—30 inch diameter boilers have two 4x6 handholes, one in each head; 36 inch diameter boilers have one 8½x14½ manhole above tubes in rear head and one 4x6 handhole in fron head below tubes; 42 inch diameter boilers have one 11x15 manhole in top of shell and one 4x6 handhole in front head below tubes; 48 inch diameter boilers and larger, have two 11x15 manholes, one in the front head below tubes and one in the shell on top.

WEIGHTS

Horse Power A. S. M. E.	17	20	20	25	30	35	40	45	50	55	60	70	75	90	100	110	120	140	155
Dimensions	30x8	30x10	36x8	36x10	36x12	42x10	42x12	42x14	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18
Boiler only	1800	2100	2300	2700	3100	4000	4600	5000	6100	6800	7500	8500	9300	11100	12200	13300	14600	16400	18000
†Full Front	735	735	905	905	905	1180	1180	1180	1975	1975	1975	2225	2225	2445	2445	2790	2790	3110	3110
Grates	240	240	350	350	430	410	500	600	575	700	700	775	925	1025	1150	1125	1265	1225	1380
*Firedoor Arches, Cast Iron	85	85	85	85	85	110	110	110	360	360	360	360	360	360	360	360	360	445	445
Return Plate or Ribs	70	70	85	85	85	125	125	125	205	205	205	245	245	245	245	285	285	325	325
Clean Out Door and Frame	80	80	80	80	80	80	80	80	125	125	125	125	125	125	125	142	142	142	142
Back Bearing Bar	15	15	20	20	20	20	20	20	25	25	25	25	25	30	30	35	35	40	40
Wall Plates and Rollers	30	30	30	30	30	40	40	40	50	50	50	50	50	50	50	100	100	100	100
Rear Wall Braces and Rods	80	80	85	95	100	95	105	110	210	220	230	220	230	240	250	240	250	300	375
Buck Bars (steel) and Rods	145	145	160	160	160	200	200	200	295	295	295	310	310	385	385	400	400	465	465
‡Steam Trimmings	50	50	50	50	50	75	75	75	130	130	130	130	130	140	140	150	150	180	180
§Complete Outfit	3330	3630	4150	4560	5045	6335	7035	7540	10050	10885	11595	12965	13925	16145	17380	18927	20377	22732	24562
*Tile Arches, add to above	....	....	....	....	....	....	....	....	325	325	325	325	325	325	325	325	325	675	675

WEIGHTS, EXTRAS

Stack and Guy Wire	300	350	360	420	480	525	600	750	720	900	1080	1000	1200	1620	1620	1740	1740	1980	1980
Suspension	....	....	....	....	....	800	850	900	1100	1100	1230	1280	1280	1690	1830	2160	2160	2300	2300

†Full front includes doors, front bearing bar and damper and damper frame.

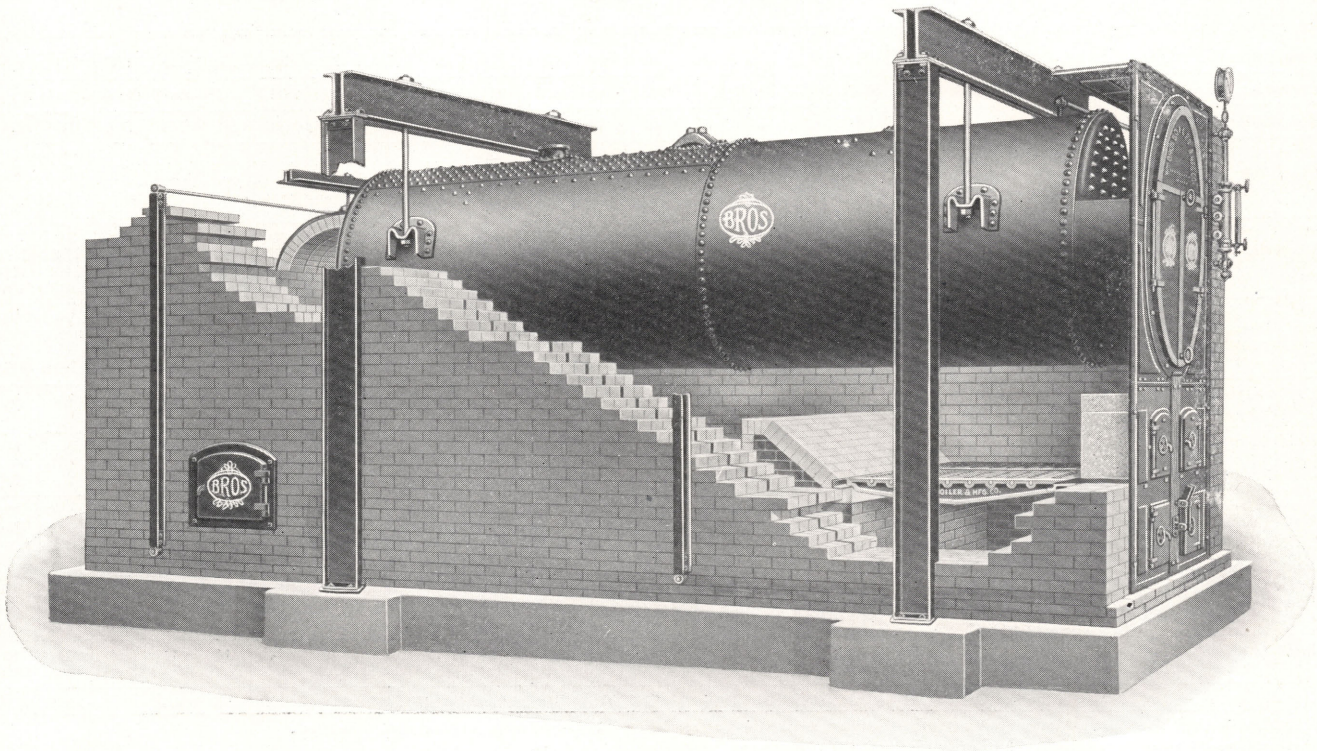
§Complete Outfit regularly consists of boiler with front (doors attached) and anchors; cast iron or fire tile arches; front and rear bearing bars; tupper grates; return plate for boilers 30, 36, 42; style C return ribs for 48, 54, 60, 66 and 72; clean-out door and frame; two cast iron rear wall braces and four steel I-beam buckstays with rods; four wall plates and rollers. Damper and frame are regularly furnished with full front.

‡Trimmings consist of water column, water gauge and glass, three gauge cocks, steam gauge, safety valve, check and stop valves and blow-off cock.

Fire tools consist of hoe, poker and slice bar. Weight about 50 pounds.

High Pressure Horizontal Tubular Boiler

Working Pressure 125 and 150 Pounds



PRICE LIST

Horse Power A. S. M. E.	45	50	55	60	70	80	90	100	110	125	150	175	180	200	200	225
Dimensions	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18	72x20	78x18	78x20	84x18	84x20
125 lb. Bare Boiler and extension	$1250	$1300	$1400	$1600	$1750	$2000	$2140	$2340	$2480	$2800	$3000	$3200	$3600	$3900	$4250	$4600
§Full Front	240	240	240	270	270	290	290	335	335	370	370	370	400	400	480	480
Grates, Stationary	60	70	70	80	90	100	110	110	122	122	135	150	150	160	175	190
†Fire Door Arches	40	40	40	40	40	40	40	40	40	50	50	50	50	50	50	50
Return Ribs, Style "B"	60	60	60	70	70	70	70	80	90	90	90	90	90	90	100	100
Clean Out Door and Frame	17	17	17	17	17	17	17	20	20	20	20	20	20	20	20	20
Back Bearing Bar	4	4	4	4	4	5	5	5	5	6	6	6	7	7	8	8
Rear Wall Braces and Thru Rods	22	22	22	22	22	24	24	24	24	40	40	40	40	40	44	44
Steel Buck Bars and Cross Rods	30	30	30	30	30	34	34	37	37	47	47	47	55	55	65	65
Steam Trimmings	150	150	150	150	150	190	190	190	190	205	205	205	205	205	205	220
Complete Outfit	$1873	$1933	$2033	$2283	$2443	$2770	$2920	$3181	$3333	$3750	$3963	$4178	$4617	$4927	$5397	$5777
150 lb. Boiler, Add	$60	$65	$60	$60	$70	$100	$100	$140	$145	$160	$160	$165	$160	$200	$200	$210

EXTRAS, ADD TO ABOVE

BROS Rocking Grates	$56	$64	$64	$72	$81	$90	$100	$100	$110	$110	$120	$132	$132	$147	$156	$169
Fire Tools	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Smoke Stack and Guys	140	180	200	190	216	290	290	310	310	320	320	370	450	525	670	750
‡Suspension 1 Boiler	130	130	130	150	150	200	200	250	250	260	260	260	300	300	450	450
‡Suspension 2 Boilers	230	230	230	280	280	330	330	410	410	480	480	480	600	600	800	800
‡Suspension 3 Boilers	400	400	400	440	440	600	600	800	800	900	900	900	1100	1100	1400	1400

§Full front includes doors, front bearing bar, damper and damper frame.

†Either tile or cast iron.

‡Suspension consists of four columns, two cross beams, foot and cap plates, suspension bolts and washers complete.

Half or three quarter front, same price as full flush fronts.

High Pressure Horizontal Tubular Boilers

Working Pressure 125 and 150 Pounds

SPECIFICATIONS

Horse Power A. S. M. E.	45	50	55	60	70	80	90	100	110	125	150	175	180	200	200	225
Dimensions	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18	72x20	78x18	78x20	84x18	84x20
Number 3″ Tubes	**46**	46														
Number 3½″ Tubes	34	**34**	34	**44**	44	54	54	66	66	86	86	86	110	110	124	124
Number 4″ Tubes	28	28	**28**	36	**36**	**44**	**44**	**54**	**54**	**70**	**70**	**70**	**88**	**88**	**106**	**106**
Heating Surface of Tubes only, 3″	**434**	506														
Heating Surface of Tubes only, 3½″	374	**436**	498	**564**	645	792	891	968	1089	1261	1418	1576	1814	2016	2046	2273
Heating Surface of Tubes only, 4″	352	411	**470**	528	**603**	**737**	**829**	**905**	**1018**	**1173**	**1320**	**1466**	**1659**	**1843**	**1874**	**2082**
Heating Surface Shell only	**101**	**117**	**133**	**132**	**151**	**168**	**189**	**184**	**207**	**201**	**226**	**251**	**245**	**272**	**272**	**294**
Thickness Shell 125 lb. Boiler	3/8	3/8	3/8	3/8	3/8	13/32	13/32	7/16	7/16	15/32	15/32	15/32	17/32	17/32	9/16	9/16
Thickness Shell 150 lb. Boiler	3/8	3/8	3/8	7/16	7/16	7/16	7/16	1/2	1/2	17/32	17/32	17/32	19/32	19/32	5/8	5/8
Thickness Heads 125 lb. Boiler	7/16	7/16	7/16	7/16	7/16	1/2	1/2	1/2	1/2	9/16	9/16	9/16	9/16	9/16	5/8	5/8
Thickness Heads 150 lb. Boiler	7/16	7/16	7/16	7/16	7/16	1/2	1/2	1/2	1/2	9/16	9/16	9/16	9/16	9/16	5/8	5/8
Two Flanged Openings, each	4	4	4	5	5	5	6	6	6	6	6	6	6	6	8	8
Blow-Off Valve	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½
Water Column Connections	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Pop Safety Valve Set 125 lbs.	2–1½	2–1½	2–1½	2–2	2–2	2–2½	2–2½	2–2½	2–2½	2–3	2–3	2–3	2–3½	2–3½	2–3½	2–4
Pop Safety Valve Set 150 lbs.	2–1½	2–1½	2–1½	2–2	2–2	2–2	2–2½	2–2½	2–2½	2–3	2–3	2–3	2–3	2–3	2–3	2–3½
Water Gauge	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Steam Gauge	5	5	5	5	5	8½	8½	8½	8½	8½	8½	8½	8½	8½	10	10
Gauge Cocks	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Check and Stop Valves	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	1½	1½	1½	2	2	2	2
Stack, Gauge	16	16	16	16	16	14	14	14	14	14	14	14	12	12	10	10
Stack Size, One Boiler	24x40	24x50	24x60	26x50	26x60	28x60	28x60	30x60	30x60	34x60	34x60	34x70	38x60	38x70	42x60	42x70
Grates, Size	48x42	48x48	48x48	54x48	54x54	60x54	60x60	66x54	66x60	72x54	72x60	72x66	78x60	78x66	78x72	78x78

Boilers with tube setting in heavy type are our standard, and always furnished this way, unless otherwise specified.

Manholes—All boilers have 11x15 inch flanged manhole under tubes in front head and in top of shell, except 48″ which has 8½x14½ inch handhole under tubes.

WEIGHTS

Horse Power A. S. M. E.	45	50	55	60	70	80	90	100	110	125	150	175	180	200	200	225
Dimensions	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18	72x20	78x18	78x20	84x18	84x20
Boiler Only	6100	6830	7350	8550	9480	11514	12754	13846	15392	17178	18824	20472	23460	25510	26494	29250
§Full Front	1975	1975	1975	2225	2225	2445	2445	2790	2790	3110	3110	3110	3400	3400	4000	4000
Grates	575	700	700	775	925	1025	1150	1125	1265	1225	1380	1450	1500	1575	1770	1950
*Fire Door Arches, C. I.	360	360	360	360	360	360	360	360	360	445	445	445	445	445	445	**445**
Return Ribs	205	205	205	245	245	630	630	700	700	780	780	780	860	860	950	**950**
C. O. Door and Frame	125	125	125	125	125	125	125	142	142	142	142	142	142	142	142	**142**
Back Bearing Bar	25	25	25	25	25	30	30	35	35	40	40	40	45	45	50	**50**
Rear Wall Braces and Thru Rods	210	220	230	220	230	240	250	240	250	300	375	400	400	425	425	**450**
Steel Buck Bars and Cross Rods	295	295	295	310	310	385	385	400	400	465	465	465	490	490	540	**540**
†Steam Trimmings	130	130	130	130	130	140	140	150	150	180	180	180	190	190	225	**225**
‡Complete Outfit	10000	10865	11395	12965	14055	16894	18269	19788	21484	23865	25741	27484	30932	33082	35041	38002
150-lb Boiler, Add	400	400	450	500	600	1000	1100	1300	1400	1600	1600	1600	1000	1000	1800	2100
*Tile Arches, Add	325	325	325	325	325	325	325	325	325	675	675	675	675	675	675	675

WEIGHTS, EXTRA

Stack and Guy Wire	720	900	1080	1000	1200	1620	1620	1740	1740	1980	1980	2310	2820	3290	4200	4900
Suspension — 1 Boiler	1100	1100	1230	1280	1280	1690	1830	2160	2160	2300	2300	2920	3080	4240	4490	4490
Suspension — 2 Boilers	2100	2210	2210	2490	2490	3150	3690	4160	4160	4810	4810	6070	6430	6430	7910	8680
Suspension — 3 Boilers	3950	3950	3950	4330	4330	5940	5940	8040	8040	9160	9160	10250	11000	11730	14100	14100

§Full front includes doors, front bearing bar, damper and damper frame.

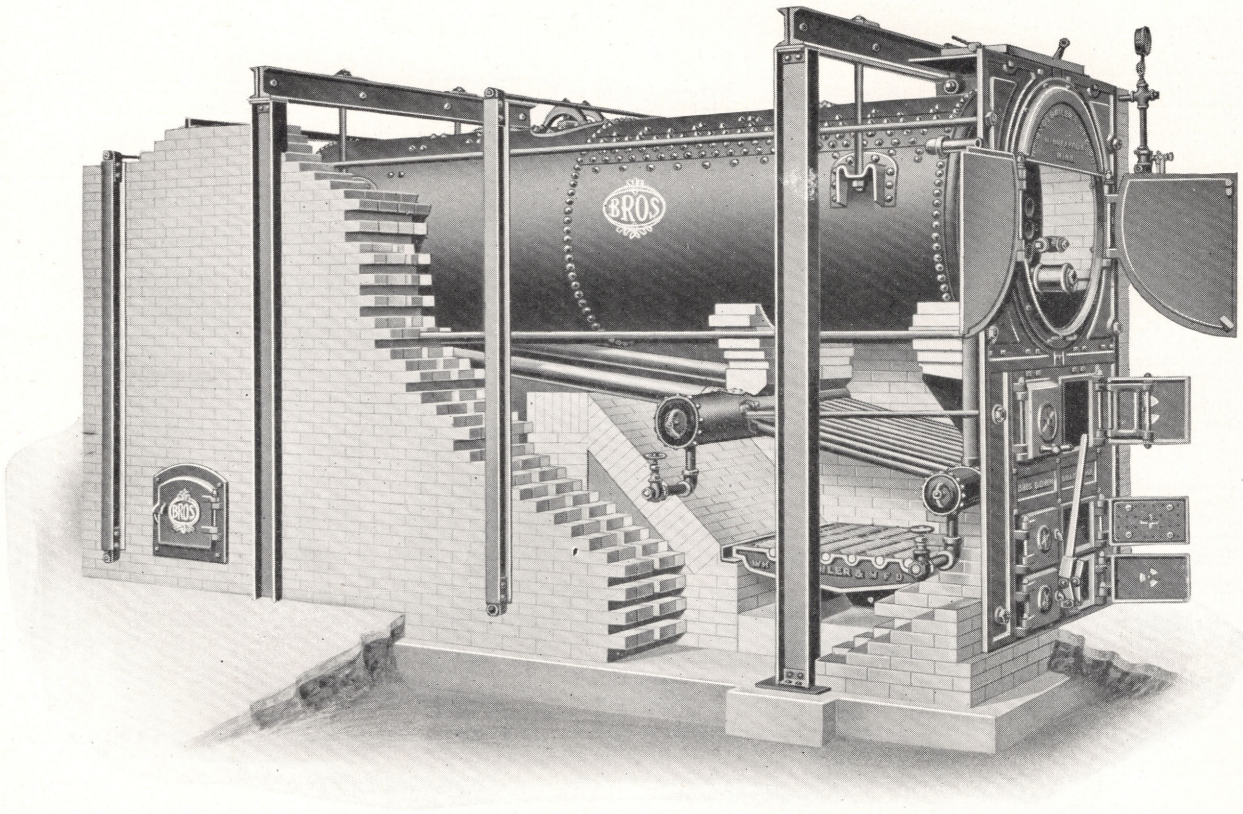
†Trimmings consist of water column, water gauge and glass, three gauge cocks, steam gauge, safety valve, check and stop valves, and blow-off cock.

‡Complete Outfit regularly consists of boiler with front doors (attached) and anchors; cast iron or fire tile arches; front and rear bearing bars; tupper grates; style "B" return ribs; clean-out door and frame; two cast iron rear wall braces and four steel I beam buckstays with rods. Damper and frame are regularly furnished with full front.

Fire tools consist of hoe, poker, and slice bar. Weight about 50 pounds.

High Pressure Tubular Boiler with Down Draft Furnaces

Working Pressure 125 and 150 Pounds



PRICE LIST

Horse Power A. S. M. E.	45	50	55	60	70	80	90	100	110	125	150
Dimensions	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18
125 lb. Bare Boiler Only	$1250	$1300	$1400	$1600	$1750	$2000	$2140	$2340	$2480	$2800	$3000
†Front, Upper Half, and Flue Doors	130	130	130	150	150	165	165	190	190	220	220
§Front, Lower Half, and D. D. Furnace	1000	1000	1000	1200	1200	1250	1250	1375	1375	1500	1500
Grates, Stationary	60	70	70	80	90	100	110	110	122	122	135
Return Ribs, Style "B"	60	60	60	70	70	70	70	80	80	90	90
Clean Out Door and Frame	17	17	17	17	17	17	17	20	20	20	20
Back Bearing Bar	4	4	4	4	4	5	5	5	5	6	6
Rear Wall Braces and Thru Rods	22	22	22	22	22	24	24	24	24	40	40
Steel Buck Bars and Cross Rods	30	30	30	30	30	34	34	37	37	47	47
Steam Trimmings	150	150	150	150	150	190	190	190	190	205	205
Complete Outfit	$2723	$2783	$2883	$3323	$3483	$3855	$4005	$4371	$4523	$5050	$5263
150 lb. Boiler, Add	$60	$65	$60	$60	$70	$100	$100	$140	$145	$160	$160

EXTRAS, ADD TO ABOVE

BROS Rocking Grates	$56	$64	$64	$72	$81	$90	$100	$100	$110	$110	$120
Fire Tools	14	14	14	14	14	14	14	14	14	14	14
Smoke Stack and Guys	140	180	200	190	216	290	290	310	310	320	320
‡Suspension: One Boiler	130	130	130	150	150	200	200	250	250	260	260
‡Suspension: Two Boilers	230	230	230	280	280	330	330	410	410	480	480
‡Suspension: Three Boilers	400	400	400	440	440	600	600	800	800	900	900

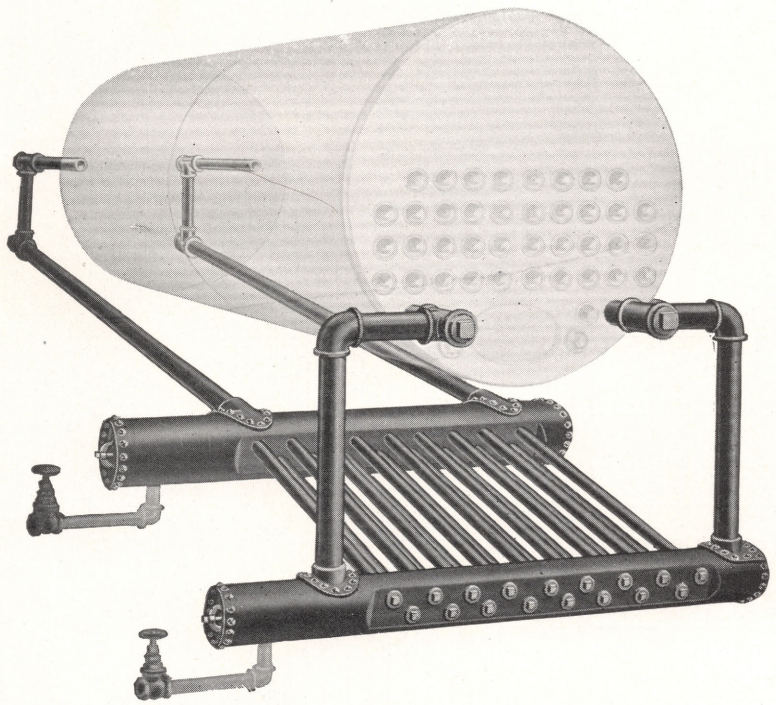
†Upper half of front includes damper and damper frame.

§Lower half of front complete with doors attached, door liners, arches, dead plates, and front bearing bars. Furnace complete with water grates, piping and connection to boiler, brass clean-out plugs, special tile, and blow-off valves on drums.

‡Suspension consists of four columns, two cross beams, foot and cap plates, suspension bolts and washers complete.

High Pressure Tubular Boiler with Down Draft Furnaces

Working Pressure 125 and 150 Pounds



Down Draft Furnaces are composed of one front header of 8″ extra heavy pipe and one rear header of 10″ extra heavy pipe. Water grates of 2⅜″ diameter seamless drawn tubing (expanded in both ends) join the headers.

The headers are made with flanged steel heads solidly riveted into the headers. Handholes are located in each head for cleaning purposes. All flanges are cast steel, of extra heavy thickness. The front header is fitted with brass plugs directly opposite each water grate to facilitate cleaning and removing the water grates. Each header is provided with 1½″ blow-off valve.

The lower half of the front, used in conjunction with the Down Draft, is of a height and width suitable for the Furnace. Each front is provided with four fire doors and two ash doors. The two upper fire doors are provided with crane hinges and swinging draft doors. The two lower fire doors are provided with registers and perforated liners. The two ash doors have registers. Between the upper and lower fire doors there is a removable panel to allow access to the brass cleanout plugs in the front header.

Each Down Draft Furnace, before leaving the shop, is tested to 250 pounds hydrostatic pressure, under which pressure it must be perfectly tight.

WEIGHTS

Horse Power A. S. M. E.	45	50	55	60	70	80	90	100	110	125	150
Dimensions	48x12	48x14	48x16	54x14	54x16	60x16	60x18	66x16	66x18	72x16	72x18
125 lb. Boiler only	5900	6600	7100	8300	9200	11200	12400	13600	15000	16800	18400
Front, Upper Half and Flue Doors	1050	1050	1050	1225	1225	1375	1375	1600	1600	1825	1825
Front, Lower Half and D. D. Furnace	3000	3075	3125	3375	3450	3750	3850	4025	4125	4300	4375
Grates	575	700	700	775	925	1025	1150	1125	1265	1225	1380
Return Ribs	550	550	550	630	630	630	630	700	700	780	780
Clean Out Door and Frame	125	125	125	125	125	125	125	142	142	142	142
Back Bearing Bar	25	25	25	25	25	30	30	35	35	40	40
Rear Wall Braces and Thru Rods	210	220	230	220	230	240	250	240	250	300	375
Steel Buck Bars and Cross Rods	295	295	295	310	310	385	385	400	400	465	465
Steam Trimmings	130	130	130	130	130	140	140	150	150	180	180
Total	11860	12770	13330	15115	16250	18900	20335	22017	23667	26057	27962
150 lb. Boiler, Add	400	400	450	500	600	1000	1100	1300	1400	1600	1600

WEIGHTS, EXTRA

Stack and Guy Wire	720	900	1080	1000	1200	1620	1620	1740	1740	1980	1980
Suspension: One Boiler	1100	1100	1230	1280	1280	1690	1830	2160	2160	2300	2300
Suspension: Two Boilers	2100	2210	2210	2490	2490	3150	3690	4160	4160	4810	4810
Suspension: Three Boilers	3950	3950	3950	4330	4330	5940	5940	8040	8040	9160	9160

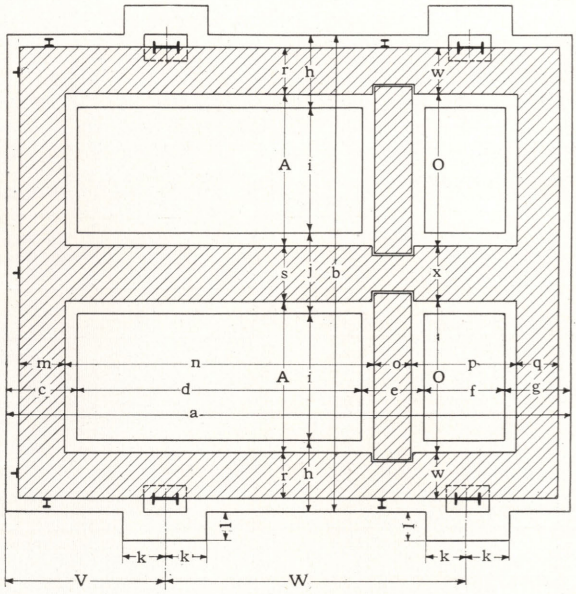
Table of Measurements Full Flush Front Settings

A	B	C		D		E		F		G		H		I		J	K	L	M	N	O	P	Q		R	S		T		U	V	W
Diameter of Boiler	Length of Boiler	Hung up	On Brackets	Hung Up	On Brackets	100	125-150	100	125-150	100	125-150	100	125-150	100	125-150	Head to Front	Full Flush	Floor to Grate	Grate to Boiler	Floor to Top of Front	Width of Grate	Length of Grate	One Boiler	Two Boilers	Length of Columns	One Boiler	Two Boilers	Single Setting	Double Setting	Center to Center of Boilers	For Hung Boilers Only	For Hung Boilers Only
30	8		14		14	30		2		36		4		2		9	13	18	24	6'- 2"	30	30						5'- 8"	9'-10"	4'- 2"		
	10		14		14	30		2		42		4		2		9	13	18	24	6'- 2"	30	30						5'- 8"	9'-10"	4'- 2"		
36	8	13	13	13	13	30		2½		36		4		2		11	13	18	24	6'- 8"	36	36	3	3	7'- 4"	5"	8"	6'- 2"	10'-10"	4'- 8"	4'- 8"	5'-10"
	10	13	13	13	13	30		2½		42		4		2		11	13	18	24	6'- 8"	36	36	4	4	7'- 4"	5"	8"	6'- 2"	10'-10"	4'- 8"	4'- 8"	7'-10"
	12	18	18	18	18	42		2½		48		4		2		11	13	18	24	6'- 8"	36	42	4	4	7'- 4"	6"	9"	6'- 2"	10'-10"	4'- 8"	5'- 1"	9'- 0"
42	10	16	16	16	16	30		2½		42		5		2		11	13	18	24	7'- 2"	42	36	4	4	7'-10"	7"	10"	6'- 8"	11'-11"	5'- 3"	5'- 1"	7'- 4"
	12	18	18	18	18	42		2⅔		54		5		2		11	13	18	24	7'- 2"	42	42	4	5	7'-10"	7"	10"	6'- 8"	11'-11"	5'- 3"	5'- 3"	9'- 0"
	14	19	19	19	19	42		3		54		5		2		11	13	18	24	7'- 2"	42	48	5	5	7'-10"	7"	10"	6'- 8"	11'-11"	5'- 3"	5'- 3"	10'-10"
48	12	20	20	20	20	42	36	4	4	48	48	6	4	2½	2½	13	16	23	24	8'- 4"	48	42	6	6	8'- 9"	8"	12"	7'- 8"	13'-10"	6'- 2"	5'-10"	8'- 8"
	14	22	22	22	22	42	42	4	4	54	48	6	4	2½	2½	13	16	23	24	8'- 4"	48	48	6	7	8'- 9"	8"	12"	7'- 8"	13'-10"	6'- 2"	6'- 0"	10'- 4"
	16	24	23	24	23	48	48	4	4	54	48	6	4	2½	2½	13	16	23	24	8'- 4"	48	48	7	7	8'- 9"	8"	12"	7'- 8"	13'-10"	6'- 2"	6'- 2"	12'- 0"
54	14	22	22	22	22	42	42	5	5	60	48	6	5	2½	2½	13	16	23	24	8'-10"	54	48	7	8	9'- 3"	8"	12"	8'- 2"	14'-10"	6'- 8"	6'- 0"	10'- 4"
	16	24	24	24	24	60	54	5	5	60	48	6	5	2½	2½	13	16	23	24	8'-10"	54	54	7	8	9'- 3"	8"	12"	8'- 2"	14'-10"	6'- 8"	6'- 2"	12'- 0"
60	16	24	24	24	24	60	54	6	5	60	48	6	5	2½	2½	15	16	24	26	9'- 7"	60	54	8	9	10'- 0"	10"	12"	8'- 8"	15'-10"	7'- 2"	6'- 4"	12'- 0"
	18	24	28	24	28	66	54	6	6	66	48	6	6	2½	2½	15	16	24	26	9'- 7"	60	60	9	9	10'- 0"	10"	15"	8'- 8"	15'-10"	7'- 2"	6'- 4"	14'- 0"
66	16	30	27	24	27	60	54	6	6	60	48	6	6	2½	2½	15	16	24	26	10'- 1"	66	54	10	10	10'- 6"	10"	15"	9'- 2"	16'-10"	7'- 8"	6'-10"	11'- 6"
	18	30	29	24	29	66	54	6	6	66	48	6	6	2½	2½	15	16	24	26	10'- 1"	66	60	10	10	10'- 6"	10"	15"	9'- 2"	16'-10"	7'- 8"	6'-10"	13'- 6"
72	16	24	29	24	29	60	54	6	6	60	48	6	6	2½	2½	17	16	26	28	10'-11"	72	54	10	12	11'- 4"	10"	15"	9'- 8"	17'-10"	8'- 2"	6'- 4"	12'- 0"
	18	34	29	24	29	66	58	6	6	66	45	6	6	2½	2½	17	16	26	28	10'-11"	72	60	10	12	11'- 4"	10"	15"	9'- 8"	17'-10"	8'- 2"	7'- 2"	13'- 2"
	20	36		24			57		6		57		6		2½	17	16	26	28	10'-11"	72	66	12	15	11'- 4"	12"	15"I	9'- 8"	17'-10"	8'- 2"	7'- 4"	14'- 0"
78	18	34		24		58		6		45		6		2½		17	16	26	28	11'- 5"	78	60	12	15	11'-10"	12"	15"I	10'- 2"	18'-10"	8'- 8"	7'- 8"	13'- 2"
	20	36		36		57		6		57		6		2½		17	16	26	28	11'- 5"	78	66	15	15	11'-10"	15"	15"I	10'- 2"	18'-10"	8'- 8"	7'-10"	14'- 0"
84	18	34		24		58		8		45		8		2½		19	16	28	30	12'- 3"	78	72	15	15	12'- 8"	15"	18"I	10'- 8"	19'-10"	9'- 2"	7'- 8"	13'- 2"
	20	36		36		57		8		57		8		2½		19	16	28	30	12'- 3"	78	78	15	18	12'- 8"	15"	18"I	10'- 8"	19'-10"	9'- 2"	7'-10"	14'- 0"

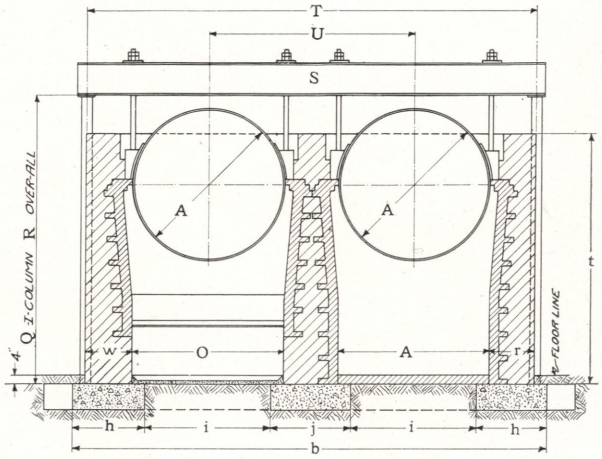
A	B	a	b		c	d	e	f	g	h	i	j	k		l		m	n	o	p	q	r	s	t	u	v	w	x
Diameter of Boiler	Length of Boiler	Length of Foundation	Single Setting	Double Setting	Rear	Space	Bridge	Space	Front Foundation	Side	Space	Center	Single Setting	Double Setting	Single Setting	Double Setting	Rear Wall	Length of Combustion Chamber	Bridge Wall	Length of Ash Pit	Front Wall	Side Wall	Center Wall	Height of Side Wall	Slope of Boiler	Return Space	Width of Furnace Wall	Furnace Center Wall
30	8	12'- 2"	6'- 0"	10'- 2"	23	4'-10"	22	22	21	23	26	24					19	5'- 2"	18	26	17	19	20	5'-11"	¾"	16	19	20
	10	14'- 2"	6'- 0"	10'- 2"	23	6'-10"	22	22	21	23	26	24					19	7'- 2"	18	26	17	19	20	5'-11"	⅞"	16	19	20
36	8	12'- 6"	6'- 6"	11'- 2"	23	4'- 8"	22	28	21	23	32	24	8	9	6	7	19	5'- 0"	18	32	17	19	20	6'- 4"	¾"	18	19	20
	10	14'- 6"	6'- 6"	11'- 2"	23	6'- 8"	22	28	21	23	32	24	8	9	6	7	19	7'- 0"	18	32	17	19	20	6'- 4"	⅞"	18	19	20
	12	16'- 6"	6'- 6"	11'- 2"	23	8'- 2"	22	34	21	23	32	24	8	10	6	8	19	8'- 6"	18	38	17	19	20	6'- 4"	1"	18	19	20
42	10	14'- 8"	7'- 0"	12'- 3"	23	6'-10"	22	28	21	23	38	25	9	10	7	8	19	7'- 2"	18	32	17	19	21	6'- 9"	⅞"	20	19	21
	12	16'- 8"	7'- 0"	12'- 3"	23	8'- 4"	22	34	21	23	38	25	9	11	7	9	19	8'- 8"	18	38	17	19	21	6'- 9"	1"	20	19	21
	14	18'- 8"	7'- 0"	12'- 3"	23	9'-10"	22	40	21	23	38	25	9	11	7	9	19	10'- 2"	18	44	17	19	21	6'- 9"	1⅛"	20	19	21
48	12	17'-11"	8'- 8"	14'-10"	34	7'- 9"	30	26	32	34	36	38	11	12	5	6	22	8'- 9"	18	38	20	22	26	7'- 7"	1"	22	22	26
	14	19'-11"	8'- 8"	14'-10"	34	9'- 3"	30	32	32	34	36	38	11	13	5	7	22	10'- 3"	18	44	20	22	26	7'- 7"	1⅛"	22	22	26
	16	21'-11"	8'- 8"	14'-10"	34	11'- 3"	30	32	32	34	36	38	11	13	5	7	22	12'- 3"	18	44	20	22	26	7'- 7"	1¼"	22	22	26
54	14	19'-11"	9'- 2"	15'-10"	34	9'- 3"	30	32	32	34	42	38	12	14	6	8	22	10'- 3"	18	44	20	22	26	8'- 0"	1¼"	22	22	26
	16	21'-11"	9'- 2"	15'-10"	34	10'- 9"	30	38	32	34	42	38	12	14	6	8	22	11'- 9"	18	50	20	32	26	8'- 0"	1½"	22	22	26
60	16	22'- 3"	9'- 8"	16'-10"	34	11'- 1"	30	38	32	34	48	38	13	16	7	10	22	12'- 1"	18	50	20	22	26	8'- 8"	1¼"	24	22	26
	18	24'- 3"	9'- 8"	16'-10"	34	12'- 7"	30	44	32	34	48	38	13	17	7	11	22	13'- 7"	18	56	20	22	26	8'- 8"	1½"	24	22	26
66	16	22'- 3"	10'- 2"	17'-10"	34	11'- 1"	30	38	32	34	54	38	14	18	8	12	22	12'- 1"	18	50	20	22	26	9'- 1"	1¼"	24	22	26
	18	24'- 3"	10'- 2"	17'-10"	34	12'- 7"	30	44	32	34	54	38	14	19	8	13	22	13'- 7"	18	56	20	22	26	9'- 1"	1½"	24	22	26
72	16	22'- 5"	10'- 8"	18'-10"	34	11'- 3"	30	38	32	34	60	38	15	20	9	14	22	12'- 3"	18	50	20	22	26	9'-10"	1¼"	24	22	26
	18	24'- 5"	10'- 8"	18'-10"	34	12'- 9"	30	44	32	34	60	38	15	21	9	15	22	13'- 9"	18	56	20	22	26	9'-10"	1⅜"	24	22	26
	20	26'- 5"	10'- 8"	18'-10"	34	14'- 3"	30	50	32	34	60	38	17	24	11	18	22	15'- 3"	18	62	20	22	26	9'-10"	1¾"	24	22	26
78	18	24'-11"	11'- 2"	19'-10"	34	13'- 3"	30	44	32	34	66	38	18	25	12	19	22	14'- 3"	18	56	20	22	26	10'- 3"	1½"	30	22	26
	20	26'-11"	11'- 2"	19'-10"	34	14'- 9"	30	50	32	34	66	38	18	26	12	20	22	15'- 9"	18	62	20	22	26	10'- 3"	1¾"	30	22	26
84	18	25'- 1"	11'- 8"	20'-10"	34	12'- 5"	30	56	32	34	72	38	19	26	13	20	22	13'- 5"	18	68	20	22	26	11'- 0"	1½"	30	25	32
	20	27'- 1"	11'- 8"	20'-10"	34	13'-11"	30	62	32	34	72	38	20	28	14	22	22	14'-11"	18	74	20	22	26	11'- 0"	1¾"	30	25	32

Hangers for Boilers 78" in Diameter and Larger are of U-Bolt, Strap and Pin Type.
Foundation 4" Wider than Walls, on 30, 36 and 42" sizes, 12" on all others.

Full Flush Front Settings



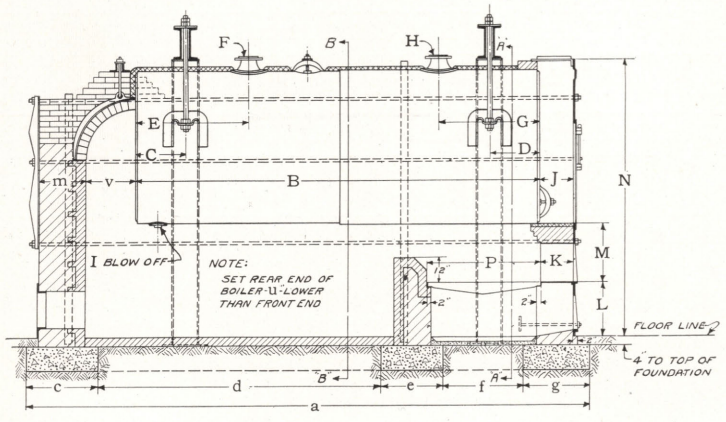
PLAN OF FOUNDATION



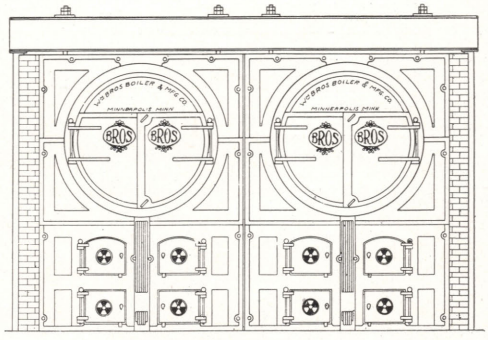
SECTION A-A SECTION B-B

NOTE:

Depth of foundation to suit conditions of soil.
Clean Out Door can be set in side or rear as desired.
Set back end of boiler lower than front end. See letter "u" in table.



LONGITUDINAL SECTION



FRONT ELEVATION

Material Required For Boiler Setting

Full Flush Fronts

TABLE OF BRICKWORK

Diameter of Boiler	Length of Boiler	Number of Fire Brick For Each Boiler	Pounds of Fire Clay For Each Boiler	Add for Each Additional 6 Inches of Height		Number of Common Brick			Number of Common Brick Add for Each 6 Inches Additional Height		
				Fire Brick Each Boiler	Pounds of Fire Clay Each Boiler	For One Boiler	For Two Boilers	For Each Additional Boiler	For One Boiler	For Two Boilers	For Each Additional Boiler
30	8	690	275	129	52	4290	6500	2210	276	414	156
	10	780	315	145	58	4980	7480	2500	310	463	173
36	8	780	315	141	57	4870	7390	2530	287	434	164
	10	890	355	157	63	5560	8380	2830	329	494	185
	12	990	390	173	70	6200	9300	3100	371	554	206
42	10	1050	420	166	67	6220	9400	3200	337	508	192
	12	1180	470	182	73	6910	10390	3490	379	568	213
	14	1290	515	198	80	7670	11480	3820	423	630	235
48	12	1510	605	204	82	10200	16310	6120	542	848	306
	14	1670	670	220	88	11270	17980	6720	598	930	334
	16	1820	725	236	95	12280	19520	7250	654	1040	362
54	14	1850	740	228	92	11980	19150	7180	604	992	340
	16	1990	795	244	98	13050	20800	7760	660	1016	368
60	16	2280	915	258	104	14460	23220	8760	675	1054	379
	18	2460	985	274	110	15760	25110	9350	733	1142	408
66	16	2500	1000	265	106	15680	25200	9510	682	1068	386
	18	2680	1070	281	113	16850	26870	10020	740	1156	415
72	16	2770	1110	297	119	17180	27440	10270	691	1084	394
	18	2980	1190	313	126	18700	30010	11320	747	1170	422
	20	3170	1270	331	133	19950	31950	12010	805	1254	451
78	18	3250	1300	327	131	19610	31430	11820	772	1210	438
	20	3500	1400	343	138	21390	34330	12940	830	1294	467
84	18	3610	1450	335	134	25390	41120	15740	821	1308	466
	20	3840	1540	353	142	27240	44080	17840	883	1400	497

SPECIFICATIONS OF SMOKE STACKS FOR ONE OR MORE BOILERS

No. of Boilers		Horse Power of Boiler..	15	20	25	30	35	40	30	35	40	45	50	55	60	70	80	90	100	110	125	150	175	180	200	200	225
	One	Diam., Inches	16	16	16	20	20	20	22	22	22	24	24	24	26	26	28	28	30	30	34	34	34	38	38	42	42
		Length, Feet	30	35	40	35	40	50	35	40	50	40	50	60	50	60	60	60	60	60	60	60	70	60	70	60	70
		Gauge Steel	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	12	10	10
		Weight	360	420	480	525	600	750	595	680	850	720	900	1080	1000	1200	1620	1620	1740	1740	1980	1980	2310	2820	3290	4200	4900
	Two	Diam., Inches	24	24	24	28	28	28	30	30	30	32	32	32	34	34	38	38	42	42	48	48	48	54	54	60	60
		Length, Feet	30	35	40	35	40	50	35	40	50	40	50	60	50	60	60	60	60	60	60	60	70	60	70	60	70
		Gauge, Steel	16	16	16	14	14	14	14	14	14	14	14	14	14	14	12	12	10	10	10	10	10	10	10	8	8
		Weight	540	630	720	945	1080	1350	1015	1160	1450	1240	1550	1860	1650	1980	2820	2820	4200	4200	4740	4740	5530	5340	6230	7260	8470
	Three	Diam., Inches	32	32	32	34	34	34	36	36	36	38	38	38	42	42	48	48	54	54	60	60	60	66	66	72	72
		Length, Feet	30	35	40	35	40	50	35	40	50	40	50	60	50	60	60	60	60	60	60	60	70	60	70	60	70
		Gauge, Steel	14	14	14	14	14	14	12	12	12	12	12	12	10	10	10	10	10	10	8	8	8	8	8	7	7
		Weight	930	1085	1240	1155	1320	1650	1540	1760	2200	2060	2440	2820	3500	4200	4740	4740	5340	5340	7260	7260	8470	7980	9310	9760	11420

Guy wire weights per hundred feet as follows: ¼″, 15 lbs.; 5/16″, 25 lbs.; ⅜″, 35 lbs.

Full Flush Front

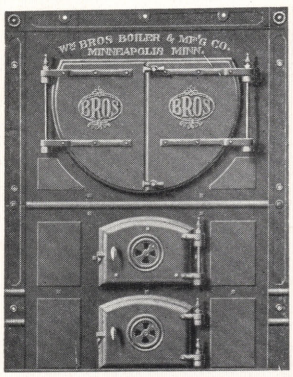
BROS FRONTS are made of heat resisting grey cast iron. They are heavy, durable and built to stand hard usage.

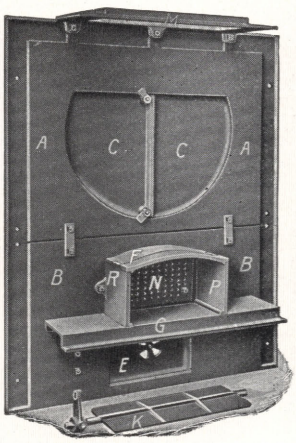
Fronts are built in sections, either in upper half, lower half or three-quarter sections. Center panels of varying height are stocked to give any additional height from the boiler to the grates. Angle iron braces are furnished on each side of the Front, facilitating erection and stiffening the Front when in place.

All doors are ground to a tight fit. Sections are chipped to fit snugly together. The doors are fitted to the frame and then hinge holes are drilled by a special drilling machine.

BROS Fronts are all completely assembled before shipment.

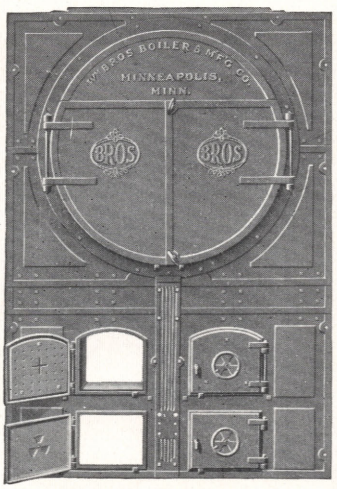
Boilers, 42 inches and smaller

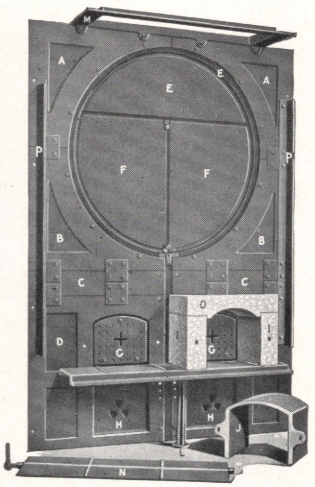




A—Top Section
B—Bottom Section
C—Flue Doors, R and L
E—Ash Door
F—Top Section Fire Door Arch
G—Front Bearing Bar
K—Damper
M—Damper Frame
N—Fire Door and Liner
P—L. H. Side Fire Door Arch
R—R. H. Side Door Fire Arch

Boilers, 48 inches and larger





A—Top Section, R and L
B—Middle Section, R and L
C—Panel Section, R and L
D—Bottom Section, R and L
E—Flue Door Ring
F—Flue Doors, R and L
G—Fire Doors and Liner, R and L
H—Ash Doors, R and L
I—Side Tile
J—Cast Iron Fire Door Arch
K—Front Bearing Bar
L—Front Bearing Bar Support
M—Damper Frame
N—Damper
O—Top Tile

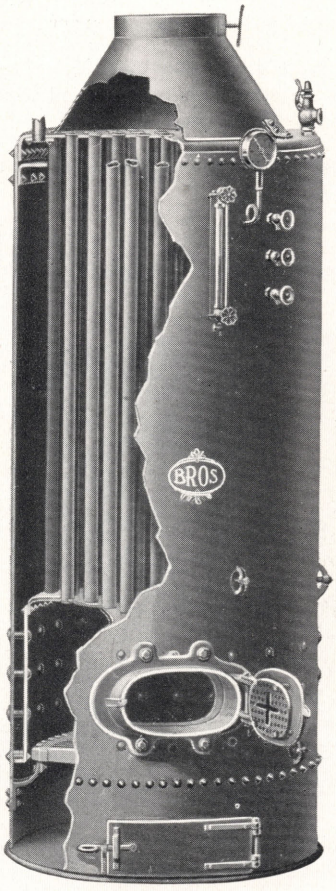
Size of Front	30	36	42
Height	5′6½″	6′0½″	6′8½″
Width	4′2″	4′8″	5′3″
Height of Upper Half	2′10″	3′4″	3′10″
Height of Lower Half	2′8″	2′8″	2′10″
Grate to Boiler	16	16	18
Grates to Floor	18	18	18
Size of Fire Door	17x11¾	17x11¾	20½x13
Size of Ash Door	17x11¾	17x11¾	20½x13
Size of Opening in Damper frame	10x20	12x20	12x31
Weight	820	990	1290
Price	$72.00	$80.00	$105.00

Above price includes front with doors attached, front bearing bar, damper and damper frame and fire door arch.

Size of Front	48	54	60	66	72	78	84
Height	8′4″	8′10″	9′7″	10′1″	10′11″	11′5″	12′3″
Width	6′1½″	6′7½″	7′1½″	7′7½″	8′1½″	8′7½″	9′1½″
Height of Upper Half	4′8¾″	5′2¾″	5′8¾″	6′2¾″	6′8¾″	7′2¾″	7′8¾″
Height of Lower Half	3′6¾″	3′6¾″	3′9¾″	3′9¾″	4′1¾″	4′1¾″	4′5¾″
Center of Boiler to Top of Front	2′4½″	2′7½″	2′10½″	3′1½″	3′4½″	3′7½″	3′10½″
Grate to Boiler	24	24	26	26	28	28	30
Grate to Floor	23	23	24	24	26	26	28
Size of Fire Door	18x16	18x16	18x16	18x16	20x18	20x18	20x18
Size of Ash Door	18x14	18x14	18x14	18x14	20x16	20x16	20x16
Size of Opening in Damper Frame	14x32	14x34	16x43	16x55	18x62	18x75	20x84
Between Doors	10¼	10¼	10¼	12¾	14¼	18¾	18¾
Weight	2340	2480	2800	3150	3560	3760	4360
Price	$174	$187	$205	$238	$262	$280	$330

Above price includes front with doors attached, front bearing bar, flue ring and doors, damper and damper frame and fire door arches.

Vertical Tube Boilers

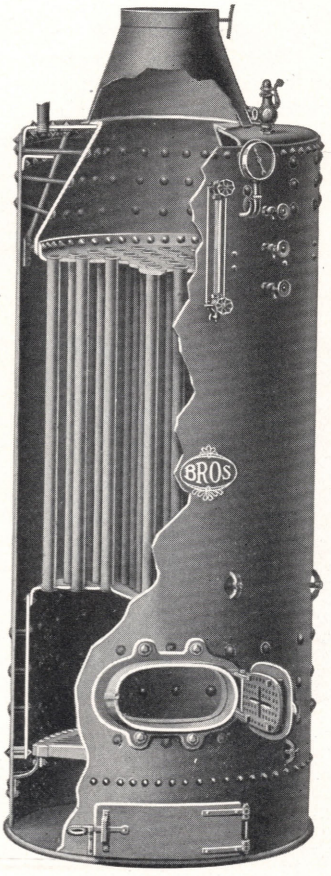


Full Length Tubes

Vertical Tube Boilers are constructed in strict accordance with the A. S. M. E. Code. The tubes are expanded, rolled and beaded into the tube sheet to insure against any leakage.

The fire door is of the locomotive type. The firebox shell is flanged outward and beaded over the outside shell and welded. This construction prevents leaks caused by a rush of cold air through the door.

Vertical Tube Boilers are carried in stock for 100 lb. pressure, but can be built on special order for higher pressures.



Submerged Tubes

SPECIFICATIONS AND PRICE LIST

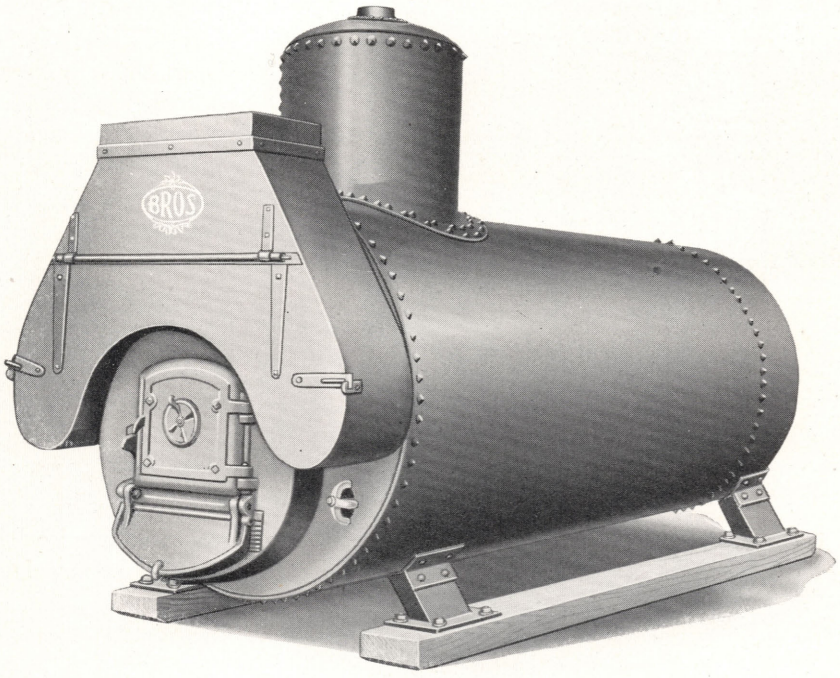
	FULL LENGTH TUBES											
Horse Power A. S. M. E.	5	6	8	10	15	20	25	30	35	40	45	50
Diameter Shell, Inches	24	24	30	30	36	36	42	42	42	48	48	48
Height Boiler, Inches	65	71	68	83	83	101	95	101	113	104	116	128
Thickness Shell, Inches	1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16
Thickness Heads, Inches	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	7/16	7/16	7/16
Thickness Fire Box, Inches	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
Diameter Fire Box, Inches	20	20	26	26	31 3/8	31 3/8	36	36	36	42 3/8	42 3/8	42 3/8
Height Fire Box, Inches	24	24	27	27	27	27	27	27	27	30	30	30
Number of 2-Inch Tubes	30	30	48	48	68	68	92	92	92	128	128	128
Length of Tubes, Inches	33	39	33	48	48	66	60	66	78	66	78	90
Size Pop Safety Valve, Inches	1/2	3/4	3/4	3/4	1	1 1/4	1 1/4	1 1/2	1 1/2	2	2	2
Size Stop and Check Valve, Inches	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1	1
Size Blow-Off Cock, Inches	1	1	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Size Steam Opening, Inches	1 1/2	1 1/2	2	2	2	2	2 1/2	2 1/2	2 1/2	3	3	3
Diameter Stack, Inches	12	12	14	14	16	16	18	18	18	24	24	24
Weight of Boiler Only, Pounds	1100	1200	1600	1800	2500	2800	3900	4100	4500	5200	5600	6000
Weight of Trimmings, Pounds	100	100	100	100	100	100	150	150	150	150	150	150
Boiler, Grates, Hood, Base Plate	$370	$390	$500	$550	$680	$760	$980	$1100	$1200	$1400	$1500	$1670
Steam Trimmings	$40	$40	$40	$40	$40	$50	$56	$56	$56	$60	$60	$60

	SUBMERGED TUBES											
Horse Power A. S. M. E.	5	6	8	10	12	15	18	20	25	30	35	40	45
Diameter Shell, Inches	24	24	30	30	30	36	36	42	42	48	48	48	48
Height Boiler, Inches	68	80	80	86	92	92	98	95	101	110	116	122	128
Thickness Shell, Inches	1/4	1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16
Thickness Heads, Inches	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	7/16	7/16	7/16	7/16
Thickness Fire Box, Inches	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
Diameter Fire Box, Inches	20	20	26	26	26	31 3/8	31 3/8	36	36	42 3/8	42 3/8	42 3/8	42 3/8
Height Fire Box, Inches	24	24	27	27	27	27	27	27	27	30	30	30	30
Number of 2-Inch Tubes	30	30	48	48	48	68	68	92	92	128	128	128	128
Length of Tubes, Inches	18	30	27	33	39	39	45	36	42	45	51	57	63
Size Pop Safety Valve, Inches	1/2	3/4	3/4	3/4	1	1	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2	2
Size Stop and Check Valve, Inches	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1	1	1	3/4	1	1
Size Blow-Off Cock, Inches	1	1	1	1	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Size Steam Opening, Inches	1 1/2	1 1/2	2	2	2	2	2	2 1/2	2 1/2	3	3	3	3
Diameter Stack, Inches	12	12	14	14	14	16	16	18	18	24	24	24	24
Weight of Boiler Only, Pounds	1250	1400	1900	2100	2250	2800	3000	3800	4050	5200	5500	6000	6200
Weight of Trimmings, Pounds	100	100	100	100	100	100	100	150	150	150	150	150	150
Boiler, Grates, Hood, Base Plate	$430	$460	$550	$650	$680	$820	$870	$1100	$1200	$1400	$1550	$1650	$1800
Steam Trimmings	$40	$40	$40	$40	$40	$45	$50	$50	$56	$56	$56	$60	$60

All boilers have hand holes for cleaning above flue sheets and mudring.
Fittings include grates, doors, water gauge, steam gauge, gauge cocks, safety valve and blow-off cock, feed valve, and check valve, and hood.

Portable Scotch Marine Boiler

Working Pressure 100 Pounds



BROS Portable Scotch Marine Boilers are built in accordance with the code of the American Society of Mechanical Engineers. The same careful methods of fabrication used on BROS Tubular and Firebox Boilers are used in the manufacture of internally fired Boilers.

Scotch Marine type of Boilers are particularly adapted for installations wherein it is necessary to have a large horse power boiler located in a small space.

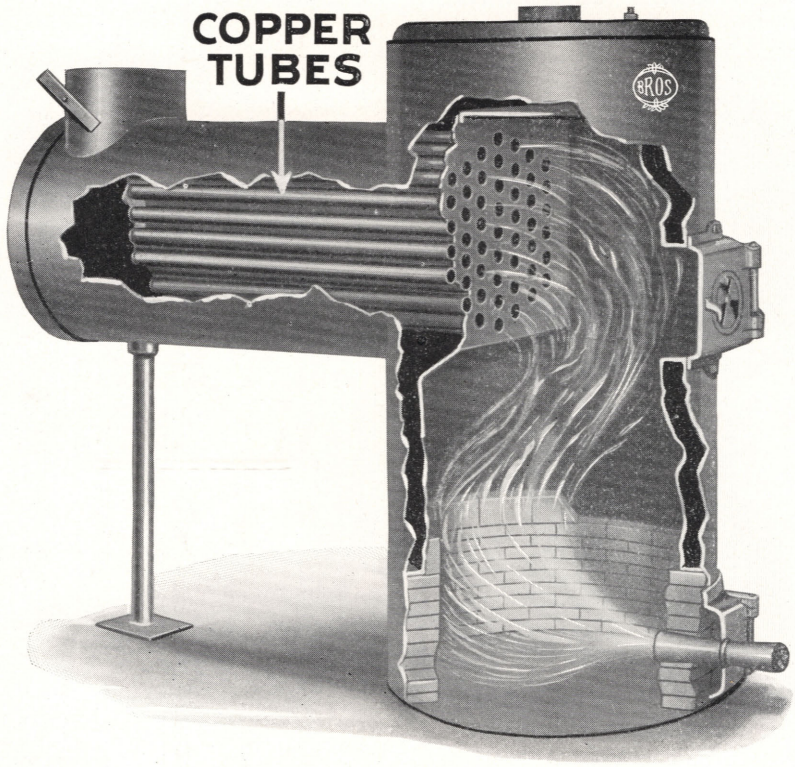
All Boilers are fitted with skids and are a complete unit in themselves. They can be readily moved with very little work.

BROS Scotch Marine Boilers are readily adapted for the use of oil.

SPECIFICATIONS AND PRICE LIST

Horsepower	Shell		Fire Box			Thickness of Steel Plate			Return Tubes			Dome		Stack Diam. Inches	Length Boiler Overall Inches	Approx. Shipping Weight on skids With reg. Fixtures Pounds	List Price	
	Diam. Inches	Length Inches	Diam. Inches	Length Inches	Length Grate Surface Inches	Shell Inches	Heads Inches	Fire Box Inches	No. of	Diam. Inches	Length Inches	Diam. Inches	Height Inches				Boiler	Fittings
12	38	89	23	78	40	5/16	3/8	13/32	16	3	73	14	20	11	102	4,400	**$1240.00**	**$50.00**
15	43	89	25	78	40	5/16	3/8	27/64	18	3	73	18	20	12	105	5,100	**1540.00**	**50.00**
20	45	94	26	83	48	5/16	7/16	7/16	25	3	78	18	20	14	113	5,700	**1760.00**	**55.00**
25	45	112	26	101	48	5/16	7/16	31/64	25	3	96	18	20	14	130	6,600	**1950.00**	**55.00**
30	48	112	26	101	48	5/16	7/16	31/64	32	3	96	22	22	18	130	8,000	**2280.00**	**60.00**
35	48	130	26	118	60	3/8	7/16	17/32	32	3	114	22	22	18	145	8,500	**2510.00**	**60.00**
40	55	118	30	101	60	3/8	1/2	17/32	43	3	96	26	26	20	135	10,000	**2850.00**	**60.00**
50	60	136	32	119	60	3/8	1/2	7/16	46	3	114	26	26	20	153	12,400	**3430.00**	**85.00**
60	60	160	32	144	60	3/8	1/2	7/16	46	3	138	26	26	24	178	14,700	**4140.00**	**85.00**
75	66	144	36	126	60	3/8	1/2	7/16	56	3	120	..	..	24	166	16,000	**5250.00**	**85.00**
100	78	168	36	150	60	1/2	9/16	7/16	68	3	144	..	..	30	190	22,600	**6520.00**	**120.00**

Oil Burning Boiler



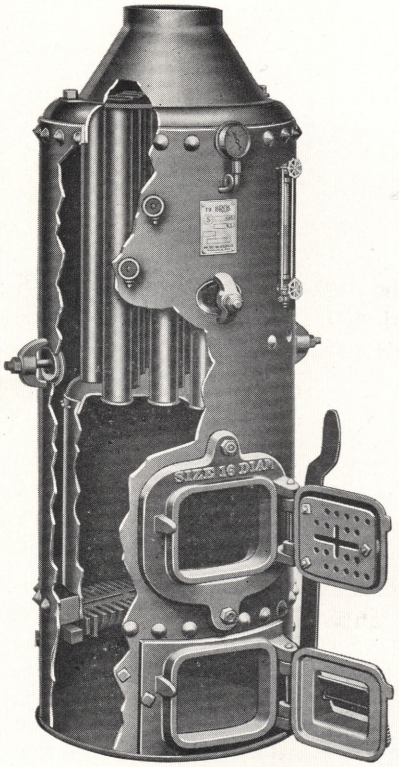
The BROS "T" Boiler is designed and built for the burning of oil. A large fire-box of sufficient combustion space insures the complete ignition of the oil in suspension. Small diameter copper tubes arranged so as to break the gas travel into small areas insures the complete absorption of all the available heat in the gases.

BROS "T" Boilers are rated and built according to the American Society of Mechanical Engineers' Code, and they are guaranteed to carry their rated load.

Radiation load is based on 1 square foot of heating surface being equivalent to 13.95 square feet of steam radiation, or 22.3 square feet of hot water radiation.

SPECIFICATIONS AND PRICE LIST

No. of Boiler	1-T	2-T	3-T	4-T	5-T	6-T	7-T
Hot Water Rating, sq. ft.	1210	1570	1935	1980	2510	2860	3565
Steam Rating, sq. ft.	758	984	1210	1237	1570	1790	2230
Total Heating Surface, sq. ft.	54.3	70.5	86.8	88	112	128	160
Length of Boiler	4′ 9″	5′ 9″	6′ 9″	6′ 2″	7′ 2″	6′ 6″	7′ 6″
Diameter of Boiler	29″	29″	29″	33″	33″	36″	36″
Height of Boiler	5′ 3¼″	5′ 3¼″	5′ 3¼″	5′ 3¾″	5′ 3¾″	5′ 7¼″	5′ 7¼″
Diameter of Fire Box	24″	24″	24″	28″	28″	32″	32″
Floor to Water Line	51″	51″	51″	51½″	51½″	55″	55″
Diameter of Stack	10″	10″	10″	12″	12″	14″	14″
Number Tubes	31	31	31	42	42	59	59
Length Tubes	24″	36″	48″	36″	48″	36″	48″
Diameter of Tubes	2″	2″	2″	2″	2″	2″	2″
Size of Outlet and Return	4″	4″	4″	5″	5″	5″	5″
Weight, lbs.	1304	1436	1568	1630	1856	2300	2535
Covering, sq. ft.	46	52	58	60	66	72	80
List Price, Boiler	$350	$400	$460	$490	$530	$680	$740
List Price, Fittings	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18



Steam Feed Cooker

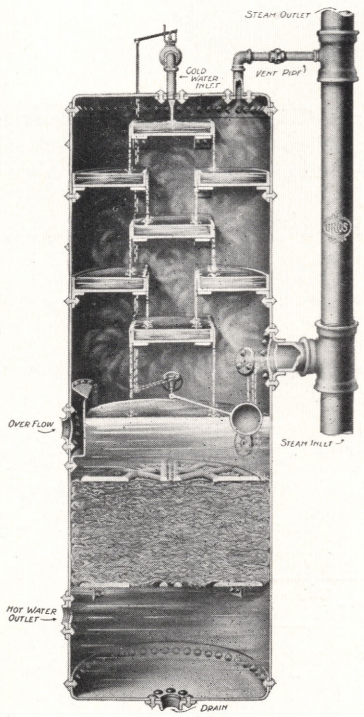
The BROS Steam Feed Cooker is designed to meet the steam needs of large stock farms, dairy farms and creameries in the cooking of feed and the sterilization of milk cans, vats, etc.

The 1½ horse power Cooker is made without a water leg but is furnished with a cast-iron liner in the firebox.

The 2 horse power Cooker is made with a water leg.

The steam trimmings include pop safety valve, water gauge, steam gauge, 2 gauge cocks, globe valve, blow-off cocks and a pump with hose and fittings.

Horse Power	Diameter	Heigth Overall	No. 2″ Tubes	Length Tubes	Shipping Weight	List Price	Steam Trimmings Extra
1½	20″	49″	13	26½″	550 lbs.	$160.00	$50.00
2	20″	49″	13	22½″	650 lbs.	220.00	50.00



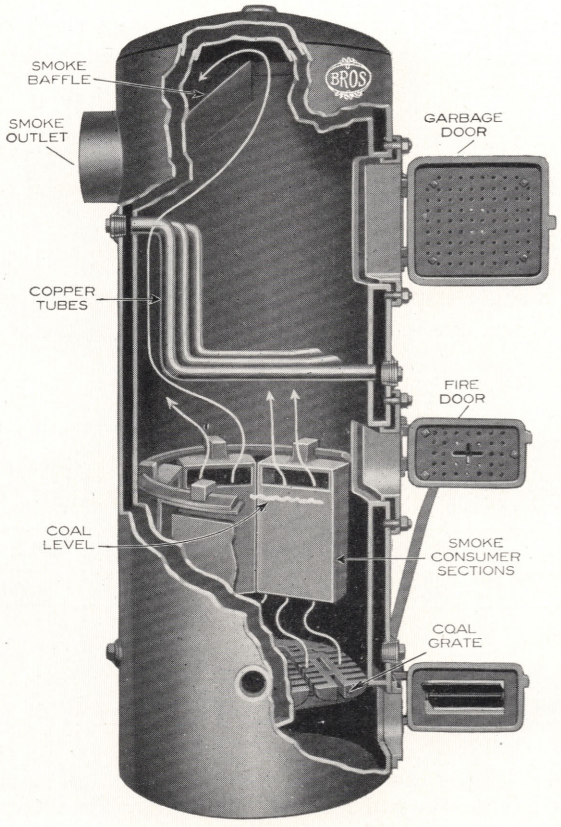
Open Feed Water Heater and Purifier

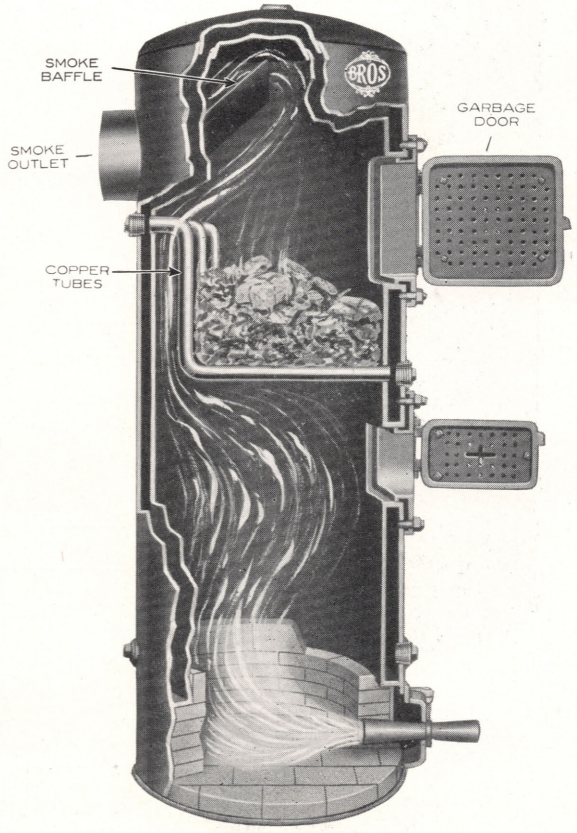
BROS Open Feed Water Heater and Purifier is the result of many years of practical experience in the study of feed-water heating. The Heater has a large effective heating and precipitating surface, a large filter and settling chamber and an overflow for the entrained oil. A large cleaning door gives easy access to the removable trays and filter chamber. A manhole is located in the settling chamber. Automatic water control is secured by a float and valve.

Number	Horse Power	Diameter Inches	Height Outside of Heads	Exhausts Inches	Hot Water Inches	Cold Water Inches	Vent Inches	Blow-Off Inches	Overflow Inches	Weight Pounds	Price
21	50	24	6′ 0″	3	1½	¾	¾	1	1	800	$230
22	100	24	7′ 6″	3½	2	1	¾	1	1	1100	284
23	150	30	7′ 2″	4	2	1	1	1	1	1300	316
24	200	30	8′ 2″	5	2½	1¼	1¼	1¼	1¼	1500	356
25	250	30	9′ 4″	6	2½	1¼	1½	1¼	1¼	1700	395
26	300	30	10′ 4″	6	3	1½	1½	1½	1½	1900	428
27	400	36	9′10″	6	3½	1½	1½	1½	1½	2300	481
28	500	36	11′ 4″	6	3½	2	1½	2	2	2800	549
29	600	42	10′ 4″	7	4	2	1½	2	2	3000	572
30	750	42	11′10″	7	4	2½	1½	2½	2½	3500	640
31	900	42	13′ 4″	7	4	2½	1½	2½	2½	4000	691
32	1000	48	11′ 6″	8	5	2½	2	2½	2½	4100	681
33	1250	48	13′ 4″	8	5	2½	2	2½	2½	4900	767
34	1500	54	12′ 6″	8	5	3	2	3	3	5300	802
35	1750	54	13′ 4″	8	5	3	2	3	3	6000	825
36	2000	54	15′ 0″	8	6	3	2	3	3	6700	900
37	2500	60	14′ 8″	10	6	3½	2½	3½	3½	7400	942
38	3000	60	16′ 0″	10	6	3½	2½	3½	3½	8300	990

All heaters are made right-hand and with threaded connections unless otherwise specified, and are provided with ½-inch water gauge and glass, regulator valve and float.

Water Heating Garbage Burner





The BROS Water Heating Garbage Burner can be operated either with coal or oil with a substantial reduction of operating cost of 25 to 35 per cent over the regular hot water heaters.

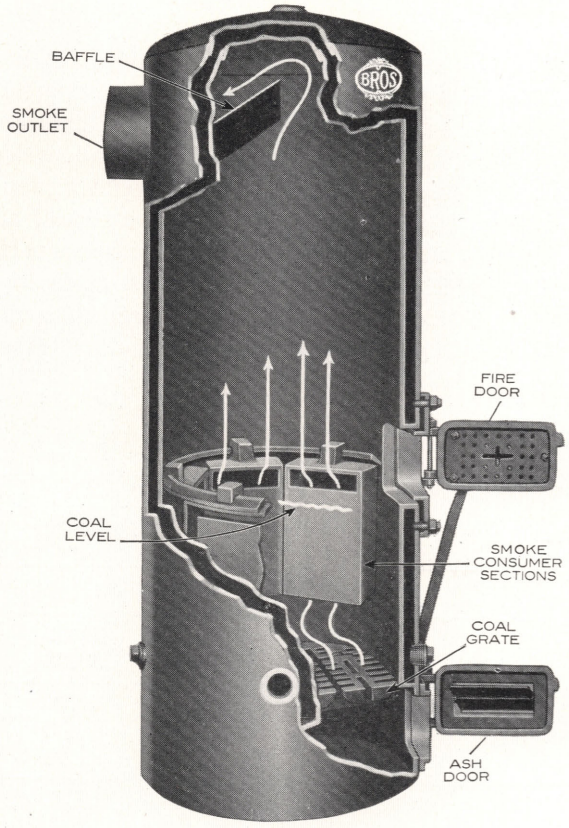
The Heater is entirely jacketed by water. The steel baffle plate in the top reverses the direction of the gases, slows them up and forces them against the boiler shell. Heavy copper tubes bent to a basket shape hold the refuse above the fire and away from the back of the Heater. Sufficient space is left between the copper tubes and the firebox shell so that it is impossible to choke off the draft. Brass clean-out plugs on each end of the copper tubes facilitates cleaning.

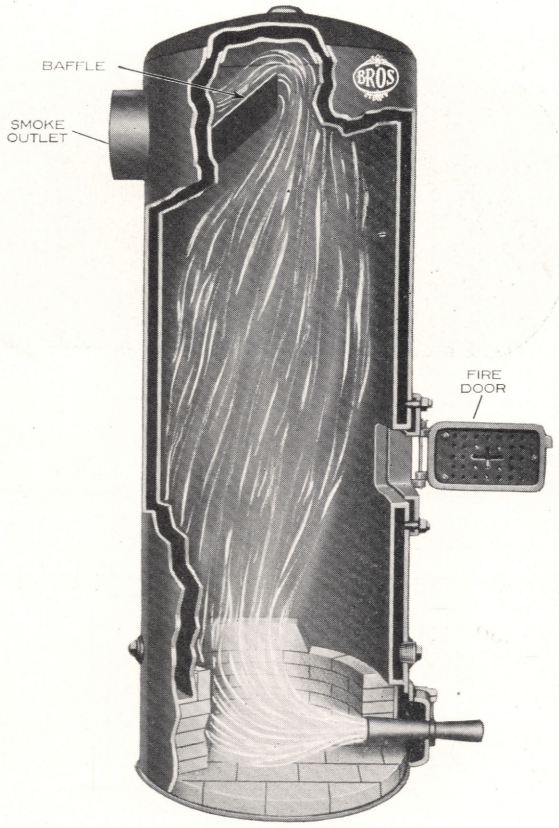
With the smoke consumer castings, it is possible to burn soft coal smokelessly and efficiently.

SPECIFICATIONS AND PRICE LIST

Size	16	20	24	28	32
Capacity { Gals. per hour	360	480	600	720	850
Capacity { Bu. per charge	2	3	4	5	6
Diameter { Floor space	21″	25″	29″	33″	37″
Diameter { Grate	16″	20″	24″	28″	32″
Height { Over all	76″	76½″	77″	78″	79″
Height { To bottom of charging door	51″	51″	50″	50″	50″
Size Door { Garbage	10x10	10x10	12x14	12x14	12x14
Size Door { Fire, Ash and Clean-out	6½x8	6½x8	7x12	7x12	7x12
Diameter Smoke Pipe	8″	8″	9″	9″	9″
Size Openings { Flow	2-2″	2-2″	2-2″	2-2″	2-2″
Size Openings { Return	2-2″	2-2″	2-2″	2-2″	2-2″
Approximate Weigh Pounds	806	996	1245	1486	1737
Price With Copper Tubes	$225.00	$260.00	$300.00	$360 00	$410.00
Smoke Consumer Castings	20.00	20.00	25.00	30 00	35.00

Hot Water Heaters





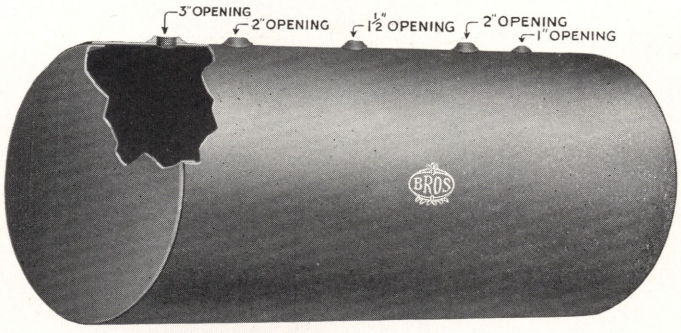
BROS Hot Water Heaters can be operated either with coal or oil with a substantial reduction of operating cost of 25% to 35% over the regular hot water heater. The Heater is entirely jacketed by water. The steel baffle plate in the top reverses the direction of the gases, slows them up and forces them against the boiler shell.

The smoke consumer castings are patented arrangement whereby the coal is burned by down draft principles. Fresh coal fills the fire box up to the white line on the casting. The fire burns from the bottom. The hot flame, following the line of least resistance, passes through the castings on the bottom and then alongside the boiler shell and out over the fresh coal. The distilled gases in the fresh coal mingle with the hot flame and are completely burned. The deep coal bed slowly feeds down on to the grates, eliminating the necessity of firing more then once in twelve hours.

SPECIFICATIONS AND PRICE LIST

Size	16	20	24	28	32
Capacity—Gals. per hour	360	480	600	720	850
Diameter {Floor space	21″	25″	29″	33″	37″
Diameter {Grate	16″	20″	25″	28″	32″
Height—Over all	76″	76½″	77″	78″	79″
Size Door—Fire, Ash and Clean-out	6½x8	6½x8	7x12	7x12	7x12
Diameter Smoke Pipe	8″	8″	9″	9″	9″
Size Opening {Flow	2-2″	2-2″	2-2″	2-2″	2-2″
Size Opening {Return	2-2″	2-2″	2-2″	2-2″	2-2″
Approximate Weight, Pounds	770	990	1210	1430	1650
Price	$190.00	$210.00	$240.00	$275.00	$320.00
Smoke Consumer Castings	20.00	20.00	25.00	30.00	35.00

Automatically Welded Oil Tanks



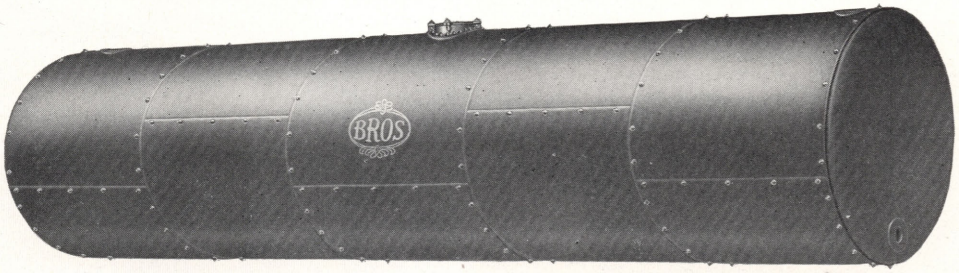
BROS Oil Storage Tanks are made with flanged heads giving a strong and neat appearing tank. Straight and round-about seams are all automatically welded. Special extra heavy welded flanges tapped for a running pipe thread after the flanges are welded on insure a perfect thread. Plugs protect the threads during shipment. All Tanks are thoroughly tested and guaranteed against leakage.

SPECIFICATIONS AND PRICE LIST

Gallons	Size	Gauge of Steel	Weight Lbs.	List Price
250	26″x45″x60″	No. 14	225	$44.00
175	38″x3′-0″	No. 16	150	21.00
295	38″x5′-0″	No. 14	240	33.00
550	48″x6′-0″	No. 12	550	77.00
550	48″x6′-0″	No. 10	700	86.00
550	48″x6′-0″	$\frac{3}{16}$	900	99.00
1000	64″x6′-0″	No. 10	1025	119.00
1000	64″x6′-0″	$\frac{3}{16}$	1350	132.00
1000	48″x11′-0″	No. 10	1000	127.60
1000	48″x11′-0″	$\frac{3}{16}$	1350	149.60
1250	64″x7′-6″	$\frac{3}{16}$	1450	167.00
1500	64″x9′-0″	$\frac{3}{16}$	1600	191.00
2000	64″x12′-0″	$\frac{3}{16}$	2144	218.00
3000	78″x12′-0″	$\frac{3}{16}$	2660	280.00
4000	90″x12′-0″	$\frac{3}{16}$	3200	337.00
5000	90″x15′-0″	$\frac{3}{16}$	3760	396.00

BROS Oval Tanks are designed to slip through narrow doors and stairways. They are stocked either for horizontal construction as per the illustration or of vertical construction. The Tanks are made with flanged heads and welded automatically. Special extra heavy welding flanges are used on all connections. Tanks are carefully tested under air pressure before shipment.

Bulk Oil Storage Tanks



BROS Riveted and Welded Bulk Storage Tanks conform with the National Underwriters' method of fabrication.

The heads are made in one piece and are flanged to give strength and rigidity to the heads. All seams are lapped and strongly riveted on 18" centers. There are sufficient rivets in each tank to more than carry the entire oil content.

The Tanks are completely assembled, riveted and then automatically welded by the latest type of automatic welding equipment.

A large size manhole is conveniently located on the top of the Tank.

All Tanks are rigidly tested and painted with a coat of rust resisting black asphaltum paint.

HORIZONTAL TANKS

Gallons	Size	Shell	Heads	Openings	Weight	List
6000	8′ x16′	3/16″	1/4″	4-2″	4300	$ 425.00
6000	8′ x16′	1/4″	1/4″	4-2″	5300	500.00
8000	10′ x13′	3/16″	1/4″	4-2″	5200	500.00
8000	10′ x13′	1/4″	1/4″	4-2″	6100	600.00
10000	10′6″x15′6″	3/16″	1/4″	4-2″	5900	650.00
10000	10′6″x15′6″	1/4″	1/4″	4-2″	7000	800.00
12000	10′6″x18′	3/16″	1/4″	4-2″	6700	700.00
12000	10′6″x18′	1/4″	1/4″	4-2″	8000	900.00
15000	10′6″x23′8″	3/16″	1/4″	4-2″	8300	850.00
15000	10′6″x23′8″	1/4″	1/4″	4-2″	10000	1100.00
18000	10′6″x28′6″	3/16″	1/4″	4-2″	9500	1000.00
18000	10′6″x28′6″	1/4″	1/4″	4-2″	11500	1300.00
20000	10′6″x31′4″	3/16″	1/4″	4-2″	10300	1100.00
20000	10′6″x31′4″	1/4″	1/4″	4-2″	12800	1400.00

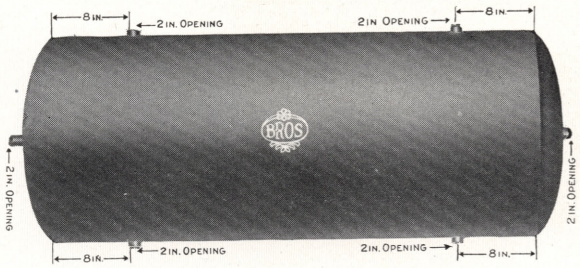
VERTICAL TANKS

Gallons	Size	Head	Lower Section	Upper Section	Top	Weight Lbs.	List
10,000	10′6x15′6″	1/4″	3/16″	No. 10	No. 12	5,200	$ 600.00
12,000	10′6″x18′0″	1/4″	3/16″	No. 10	No. 12	5,700	650.00
15,000	10′6″x23′8″	1/4″	3/16″	No. 10	No. 12	7,000	800.00
18,000	10′6″x28′6″	1/4″	3/16″	No. 10	No. 12	8,000	950.00
20,000	10′6″x31′4″	1/4″	3/16″	No. 10	No. 12	8,700	1,050.00

Hot Water Tanks

For Water Storage Purposes

Standard



Size Tank	Capacity Gals.	Thickness Shell	Thickness Heads Convex	Thickness Heads Concave	Weight Tank Only	Price Tank Only
24x5	120	3/16"	1/4"	5/16"	380	$123.00
6	140	3/16"	1/4"	5/16"	420	134.00
8	190	3/16"	1/4"	5/16"	540	170.00
10	235	3/16"	1/4"	5/16"	639	204.00
30x 6	220	3/16"	1/4"	5/16"	575	173.00
8	295	3/16"	1/4"	5/16"	715	211.00
10	365	3/16"	1/4"	5/16"	860	260.00
12	435	3/16"	1/4"	5/16"	1000	300.00
36x 6	315	3/16"	1/4"	3/8"	680	206.00
8	420	3/16"	1/4"	3/8"	860	256.00
10	525	3/16"	1/4"	3/8"	1025	293.00
12	630	3/16"	1/4"	3/8"	1185	350.00
14	735	3/16"	1/4"	3/8"	1350	400.00
42x 8	575	3/16"	5/16"	3/8"	1100	333.00
10	720	3/16"	5/16"	3/8"	1280	375.00
12	865	3/16"	5/16"	3/8"	1470	415.00
14	1000	3/16"	5/16"	3/8"	1670	468.00
16	1150	3/16"	5/16"	3/8"	1875	515.00

Manhole in head, add $10.00 net. Handhole in head, add $5.00 net.
Manhole in shell, add $15.00 net. Handhole in shell, add $8.00 net

Hot Water Tanks

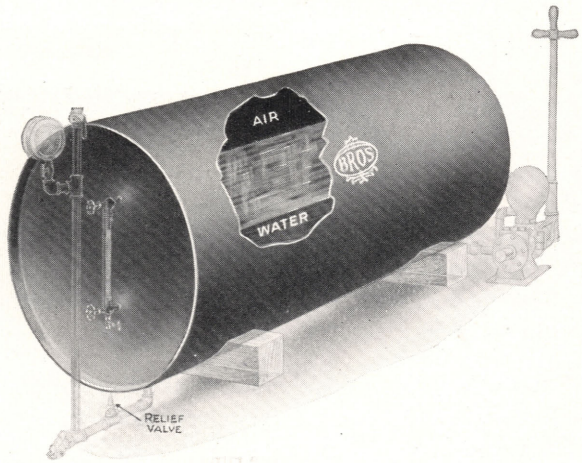
Extra Heavy

Size Tank	Capacity Gals.	Thickness Shell	Thickness Heads Convex	Thickness Heads Concave	Weight Tank Only	Price Tank Only
30x 6	220	3/16"	1/4"	5/16"	575	$198.00
8	295	3/16"	1/4"	5/16"	715	242.00
10	365	3/16"	1/4"	5/16"	860	300.00
36x 6	315	1/4"	5/16"	3/8"	995	264.00
8	420	1/4"	5/16"	3/8"	1210	328.00
10	525	1/4"	5/16"	3/8"	1445	385.00
12	630	1/4"	5/16"	3/8"	1675	425.00
42x 6	430	1/4"	5/16"	3/8"	1210	345.00
8	575	1/4"	5/16"	3/8"	1475	420.00
10	720	1/4"	5/16"	3/8"	1740	489.00
12	865	1/4"	5/16"	3/8"	2000	540.00
14	1000	1/4"	5/16"	3/8"	2265	614.00
16	1150	1/4"	5/16"	3/8"	2525	700.00
48x 8	750	1/4"	3/8"	7/16"	1800	510.00
10	940	1/4"	3/8"	7/16"	2100	580.00
12	1130	1/4"	3/8"	7/16"	2400	650.00
14	1300	1/4"	3/8"	7/16"	2700	715.00
16	1500	1/4"	3/8"	7/16"	3000	800.00

Manhole in head, add $10.00 net. Handhole in head, add $5.00 net.
Manhole in shell, add $15.00 net. Handhole in shell, add $8.00 net.

Hydro-Pneumatic Tanks

For Water Supply System



Size Tank	Cap. Gals.	Wt. Lbs.	Thickness Shell	Thickness Heads	Regular Connections	Tapped for Water Gauge Horiz.	Tapped for Water Gauge Vert.	Price
24x5	115	365	3/16"	5/16"	1¼"	½x14	½x22	$120.00
6	140	410	3/16"	5/16"	1¼"	½x14	½x22	135.00
8	190	515	3/16"	5/16"	1¼"	½x14	½x30	170.00
10	235	615	3/16"	5/16"	1¼"	½x14		204.00
30x5	180	500	3/16"	5/16"	1¼"	½x14	½x22	155.00
6	220	560	3/16"	5/16"	1¼"	½x14	½x22	172.00
7	258	620	3/16"	5/16"	1¼"	½x14	½x22	190.00
8	295	700	3/16"	5/16"	1¼"	½x14	½x30	212.00
10	365	845	3/16"	5/16"	1¼"	½x14		244.00
12	435	980	3/16"	5/16"	1¼"	½x14		275.00
36x6	315	680	3/16"	5/16"	1¼"	½x22	½x22	205.00
7	368	770	3/16"	5/16"	1¼"	½x22	½x22	230.00
8	420	860	3/16"	5/16"	1¼"	½x22	½x30	255.00
10	525	1025	3/16"	5/16"	1¼"	½x22		295.00
12	630	1185	3/16"	5/16"	1¼"	½x22		330.00
14	735	1340	3/16"	5/16"	1¼"	½x22		380.00
42x8	575	1465	1/4"	3/8"	1½"	½x26	½x30	365.00
10	720	1585	1/4"	3/8"	1½"	½x26		425.00
12	865	1825	1/4"	3/8"	1½"	½x26		480.00
14	1000	2150	1/4"	3/8"	1½"	½x26		545.00
16	1150	2450	1/4"	3/8"	1½"	½x26		600.00
48x10	940	2000	1/4"	7/16"	2"	½x30		490.00
12	1130	2225	1/4"	7/16"	2"	½x30		560.00
14	1300	2600	1/4"	7/16"	2"	½x30		620.00
16	1500	2925	1/4"	7/16"	2"	½x30		690.00
18	1700	3200	1/4"	7/16"	2"	½x30		760.00
20	1880	3525	1/4"	7/16"	2"	½x30		835.00
24	2260	4100	1/4"	7/16"	2"	½x30		965.00

Manhole in head, add $10.00 net. Handhole in head, add $5.00 net.
Manhole in shell, add $15.00 net. Handhole in shell, add $8.00 net.

Tank Construction

BROS Storage Tanks and Pneumatic Tanks are built of the best material obtainable. The heads are flanged and dished to a radius equal to the diameter of the shell.

Standard Storage and Pneumatic Tanks of 24", 30" and 36" diameter are automatically welded.

Standard Storage and Pneumatic Tanks of 42" diameter and larger are riveted with a double riveted straight seam and a single riveted round about.

Extra heavy Storage 36" diameter and larger are riveted.

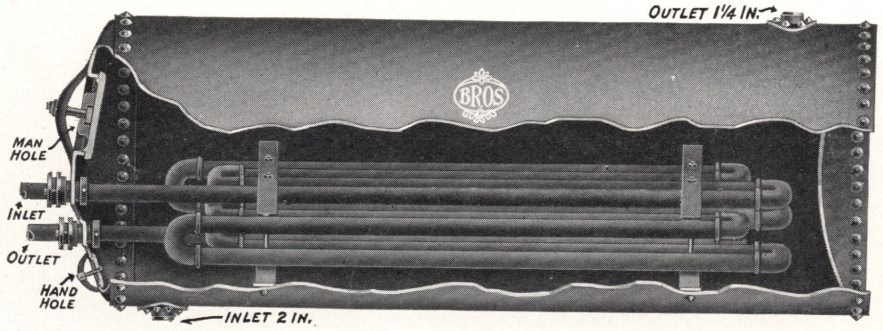
Standard Storage Tanks are tested to 100 lbs. pressure and are guaranteed for 65 lbs. working pressure.

Extra heavy Storage Tanks are tested to 150 lbs. pressure and are guaranteed for 100 lbs. working pressure.

Pneumatic Tanks are tested to 150 lbs. pressure and are guaranteed for 75 lbs. pressure.

Pneumatic Tanks 8′ in length or less are tapped either for vertical or horizontal openings. Those over 8′ are tapped only for horizontal.

Exhaust Steam Water Heaters



BROS Exhaust Steam Water Heaters are constructed of the best material obtainable. A large size manhole, conveniently located, gives easy access to the tank for cleaning.

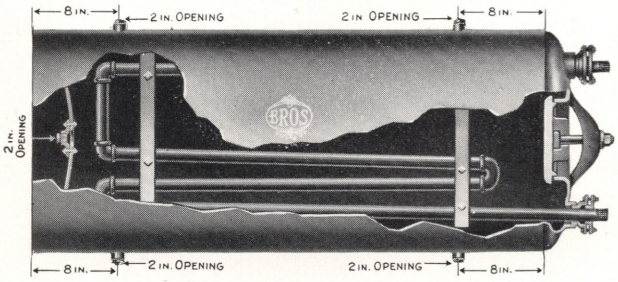
The steam coil consists of twelve runs of 2 inch pipe connected by wide return bends. The coils are solidly braced in every direction. BROS patented stuffing boxes allow for expansion and contraction of the steam coil.

All tanks are carefully tested to 175 lbs. test pressure before shipment. 125 lbs.

SPECIFICATIONS AND PRICE LIST

Size	Capacity Gallons	Weight Pounds	Size Inlet	Size Outlet	Size of Coil	Lineal Feet	Sq. Ft. Coil Htg. Surface	List Price	
								Blk. Coil	Galv. Coil
24″x8′	170	1000	2″	1¼″	2″	93	58	$230.00	$250.00
30″x8′	275	1170	2″	1¼″	2″	93	58	250.00	270.00
36″x6′	300	1060	2″	1¼″	2″	69	43	270.00	290.00
36″x6′	295	1360	2″	1¼″	2½″	71	54	290.00	310.00
36″x8′	400	1320	2″	1¼″	2″	93	58	300.00	320.00
36″x8′	390	1540	2″	1¼″	2½″	95	72	330.00	350.00
42″x8′	555	1560	2″	1¼″	2″	93	58	400.00	420.00
42″x8′	545	1780	2″	1¼″	2½″	95	72	430.00	450.00

Coils for Hot Water Tanks

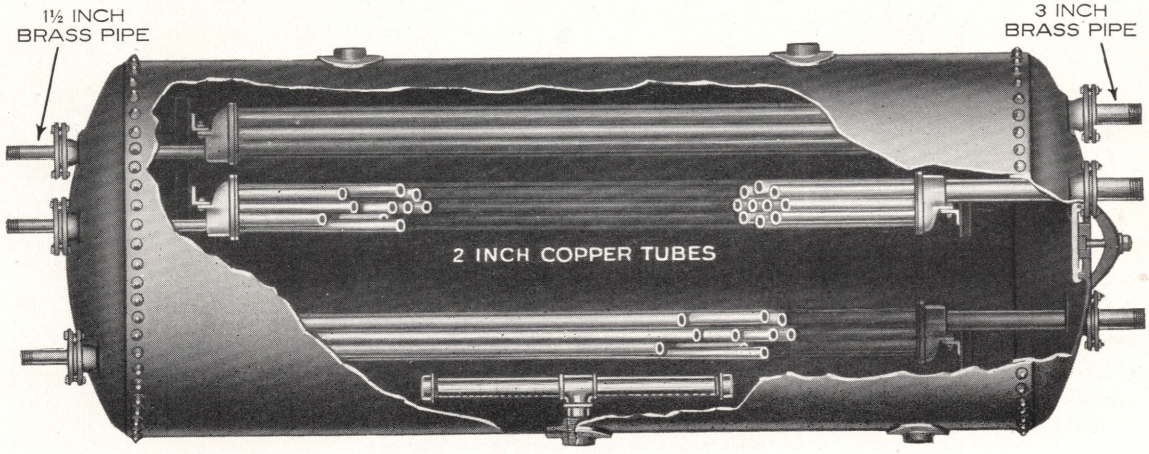


BROS Coils For Hot Water Tanks are made either of black, galvanized, brass or copper piping. The Coils consist of four runs of pipe connected by extra heavy, wide, return bends. The Coils are rigidly braced in every direction in the tank. BROS patented stuffing boxes allow the Coils to expand or contract without stress or strain. All Coils are thoroughly tested before shipment.

Tank Size	Size of Pipe	Weight Coil	Price Coils		
			Black	Brass or Copper	Galv.
24x6	1¼″	76	$38.50	$120.00	$48.00
8	1¼″	94	41.50	145.00	54.00
10	1¼″	112	45.00	170.00	60.00
30x6	1¼″	81	38.50	120.00	48.00
8	1¼″	100	41.50	145.00	54.00
10	1¼″	117	45.00	170.00	60.00
12	1¼″	135	49.00	195.00	66.00
36x6	1½″	104	51.00	160.00	62.00
8	1½″	126	57.50	200.00	70.00
10	1½″	148	64.00	240.00	78.00
12	1½″	170	70.50	280.00	86.00
14	1½″	192	77.00	320.00	93.00
42x6	1½″	114	51.00	160.00	62.00
8	1½″	137	57.50	200.00	70.00
10	1½″	159	64.00	240.00	78.00
12	1½″	181	70.50	280.00	85.00
14	1½″	203	77.00	320.00	93.00
16	1½″	225	84.00	360.00	101.00
48x8	2″	170	80.00	240.00	100.00
10	2″	200	90.00	290.00	110.00
12	2″	230	100.00	340.00	120.00
14	2″	260	110.00	390.00	130.00
16	2″	290	120.00	440.00	140.00

Copper Tube Water Heater

For Exhaust or Live Steam



The design of the BROS Hot Water Heater is the result of careful study and experimentation in the building of heaters. All the disadvantages of ordinary heaters are eliminated.

Each Heater is composed of a number of heating elements arranged so as to temper the hot water in the top and to heat the cold water in the bottom. Elements are separately controlled and can be used individually or collectively to handle the hot water demand.

Each element is composed of ten 2″ heavy copper tubes with the ends firmly rolled and beaded into cast steel headers. The copper tubes are spaced 1 inch apart to increase the rapidity of the circulation. A 3″ brass steam pipe furnishes the steam inlet to each element, and a 1½″ brass pipe furnishes the condensate outlet.

Each element is furnished with BROS patented stuffing boxes which enable the elements to expand or contract without cracking or warping of the tubes. Any number of elements can be placed in the tank at the time of fabrication. Additional elements can readily be installed later to handle increased hot water load.

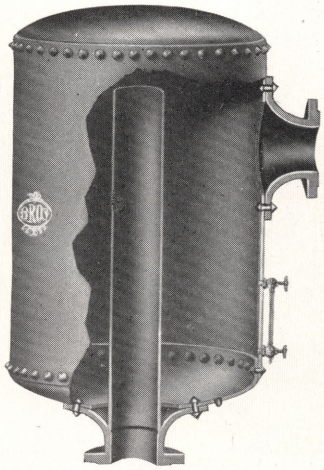
The cold water is evenly distributed over the entire tank by means of a perforated pipe located in the bottom of the tank.

All elements can be removed through the manhole.

Capacity of one Bank of Tubes
1′-0″ Long with Exhaust Steam
at 5 lbs. Pressure as per
Table Below.

Rise of Temperature Desired	Heating Capacity Gals. Per Hour
100°	240
125°	170
140°	129
160°	101

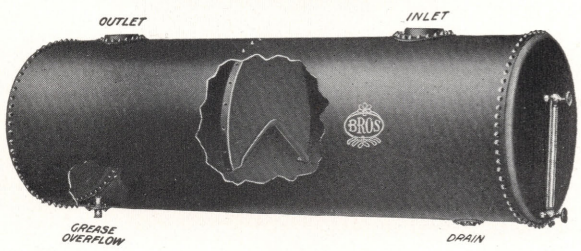
Steam Receivers



BROS Steam Receivers are built in accordance with the code of the American Society of Mechanical Engineers. Taylor forged steel nozzles are used on both the inlet and outlet. Rivets, wherever possible, are hydraulically driven. All Steam Receivers are built for 150 pounds working pressure. They are carefully caulked and tested before shipment.

HorsePower of Engine	Diameter Inches	Length Inches	Capacity Cubic Inches	Usual Size Steam Pipe—Inches	Thickness Shell	Thickness Heads	Weight
40	16	24	4390	3	¼	⅜	220
50	16	30	5596	3	¼	⅜	250
60	18	28	6518	3	¼	⅜	230
65	18	30	7026	3½	¼	⅜	240
75	20	30	8492	3½	¼	⅜	290
95	20	36	10376	3½	¼	⅜	320
90	22	30	10280	3½	¼	⅜	340
115	22	36	12560	4	¼	⅜	380
110	24	30	12144	3½	¼	⅜	360
135	24	36	14856	4	¼	⅜	400
160	24	42	17568	4	¼	⅜	440
180	28	36	19785	4½	5/16	⅜	510
215	28	42	23481	4½	5/16	⅜	560
250	28	48	27177	5	5/16	⅜	610
205	30	36	22670	4½	5/16	⅜	660
245	30	42	26912	4½	5/16	⅜	720
285	30	48	31154	5	5/16	⅜	780
345	36	42	37999	6	⅜	7/16	880
400	36	48	44170	6	⅜	7/16	970
455	36	54	50212	8	⅜	7/16	1060

Grease Extractor



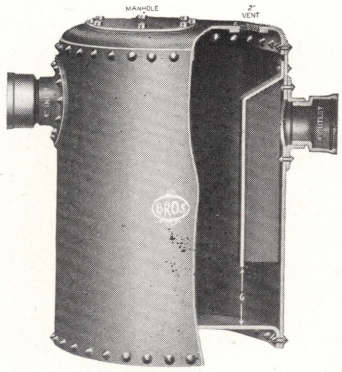
BROS Grease Extractors are simple in construction, yet very effective in operation. The large volume of the Extractor slows up the velocity of the steam, allowing the oil particles to precipitate. The deflecting plate with its curved lip catches the balance of the suspended oil particles.

Extractors are built either in horizontal or vertical position.

Blow-off Tank

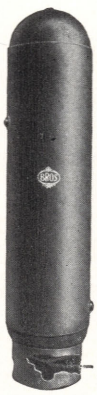
Blow-off Tanks, or Drainage Catch Basins, are made of ¼″ shell and ⅜″ heads and are fitted with a 4″ inlet and outlet.

Catch Basins are provided with a seal on the outlet and a 10x14″ manhole in the cover.



Size	Weight	Price	Size	Weight	Price
16″x16″	270	$ 50.00	30″x30″	614	$ 90.00
20″	297	55.00	36″	660	95.00
24″	320	60.00	42″	709	100.00
			48″	759	105.00
18″x18″	321	60.00	54″	813	110.00
24″	352	65.00	60″	859	115.00
30″	388	70.00			
			36″x36″	800	105.00
20″x24″	383	65.00	42″	851	110.00
30″	424	70.00	48″	912	115.00
36″	457	75.00	54″	968	120.00
			60″	1034	125.00
24″x30″	470	75.00			
36″	526	80.00	42″x42″	1019	125.00
42″	567	85.00	48″	1080	130.00
48″	609	90.00	54″	1151	135.00
54″	654	95.00	60″	1217	140.00
60″	695	100.00			
			48″x48″	1260	145.00
26″x30″	516	80.00	54″	1341	150.00
36″	560	90.00	60″	1412	155.00
42″	605	95.00	66″	1493	160.00
48″	649	100.00	72″	1569	165.00
54″	690	105.00			

Air Tanks

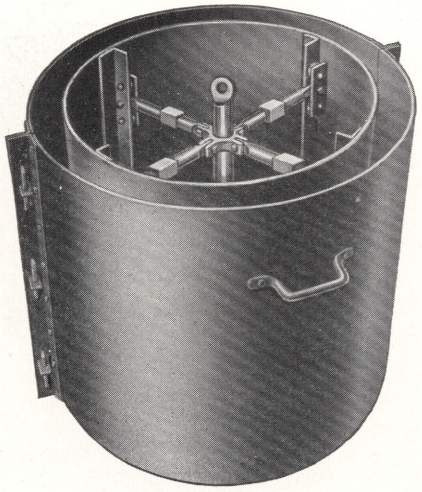


Size	CAPACITY		Weight	Price
	Cu. Ft.	Gals.		
14x30	3½	26	70	$22.80
36	4	30	80	24.30
48	5	37	100	26.40
16x36	5	37½	136	25.70
48	7	52½	146	28.60
60	9½	71	175	32.85
20x48	11	82½	240	41.40
60	13	97½	280	45.70
24x48	16	120	285	54.30
60	19	142½	340	60.00
72	22	165	380	66.00
30x60	32	241	650	100.00
72	37	278	740	110.00
96	47	351	925	130.00

Air Tanks are welded absolutely tight for a 300 lb. test pressure. Tanks are built for 175 lb. working pressure. Air Tanks are tapped for either horizontal or vertical position.

Prices on larger size Tanks, either of the riveted or welded construction, given on application.

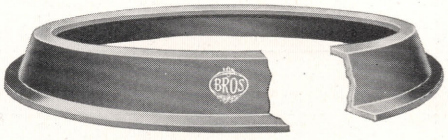
Concrete Moulds



Concrete Molds are made heavy and substantial to hold their shape under hard usage. All Molds are quick acting with 3, 4, 5 and 6 arms per set for the spreaders. Molds of any length or wall thickness are made on special orders.

Molds	4 Ft.	6 Ft.	8 Ft.
15 and 18″	$114.00	$142.50	$171.00
24″	126.00	157.50	189.00
30″	142.00	177.50	213.00
36″	158.00	193.50	250.00
42″	172.00	215.00	258.00
48″	194.00	242.50	291.00
54″	234.00	.....	.....
60″	272.00	.....	.....

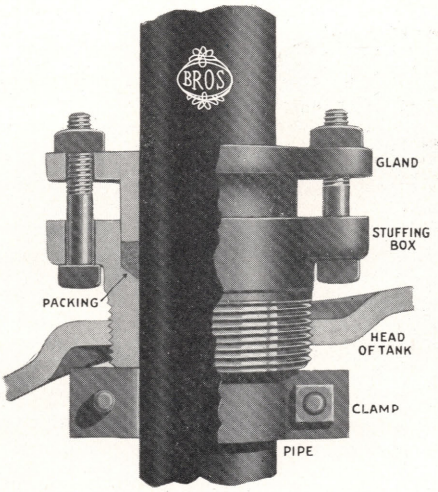
Concrete Rings



BROS Concrete Rings are made of best cast iron and are machined inside and outside, to insure correct diameters.

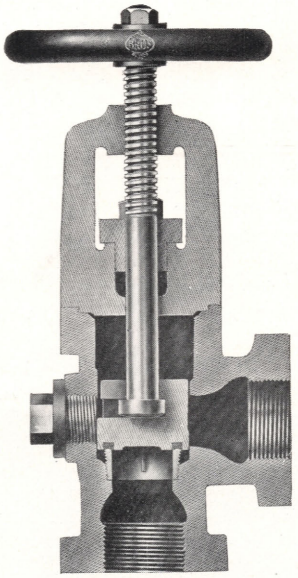
12 and 15″	$ 3.30
18″	4.00
24″	6.20
30″	10.40
36″	12.00
42″	16.50
48″	19.00
54″	23.80
60″	28.00

Stuffing Box



BROS Stuffing Boxes allow for the expansion and contraction of the pipe coils. They are easily removed from the tank for replacement of coils. Standard sizes are stocked for immediate shipment.

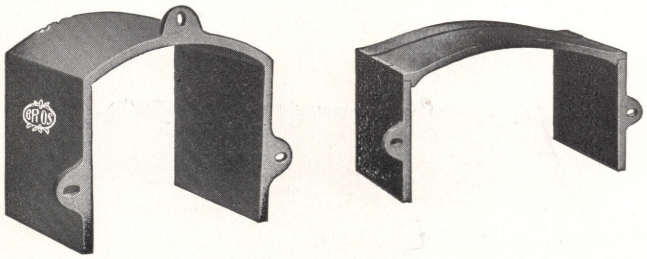
Extra Heavy Blow-off Valves



BROS Blow-off Valves are built and designed to withstand the hard service involved in blowing down a boiler. The bonnet and valve are easily taken apart and replaced. A hard babbit seat in the disc rests on a brass seat. All parts are carefully machined to give a smooth working valve.

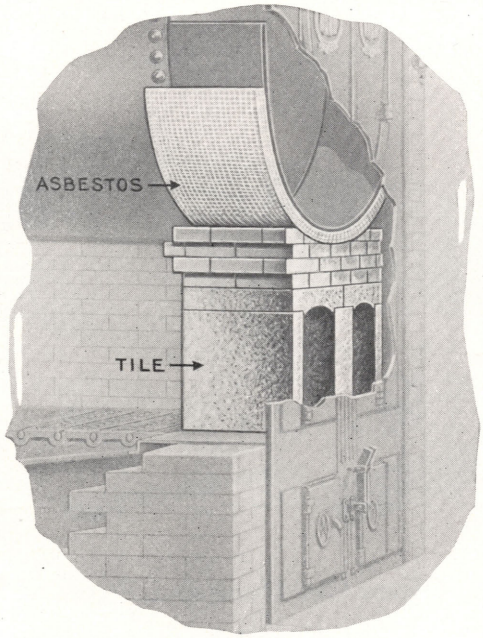
Price each $30.00

Cast Iron Fire Door Arches



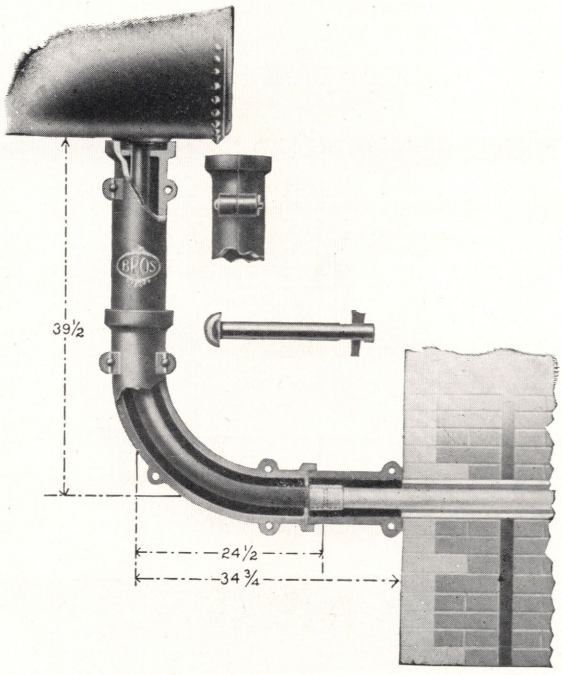
Cast Iron Fire Door Arches are stocked for immediate shipment for all BROS fronts Special Arches for any size fire doors or width of bearing bar can be furnished on short notice.

Tile Fire Door Arches



All Tile Arches are made of the same tough refractory material as fire brick. They are of simple design and extremely heavy in construction. Bolts are used to hold the Arches securely together and firmly in place.

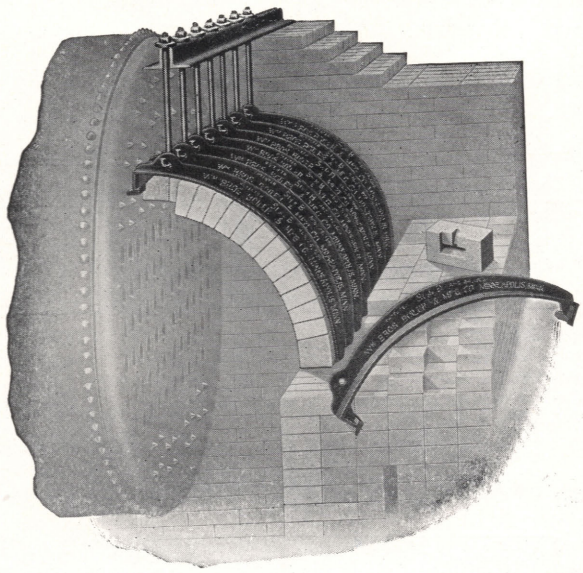
Curved Blow-off Pipe and Protecting Sleeve



The BROS Blow-Off Pipe is made of 2½″ extra heavy seamless pipe bent to a radius of 18″, and the Protecting Sleeve has 1″ air space between it and the Pipe. Each Sleeve is made in sections held together by key bolts and rivets. Protecting Sleeve castings are made of extra heavy thickness to stand hard usage.

Price, Curved Pipe only $14.00
Price, Cast Iron Casing only 36.00

"B" Return Ribs



Style "B" Return Ribs are strong and durable. Special end tile hold the ordinary brickwork securely in place. The Ribs are hung from a steel support, allowing for expansion and contraction of the boiler and brick walls.

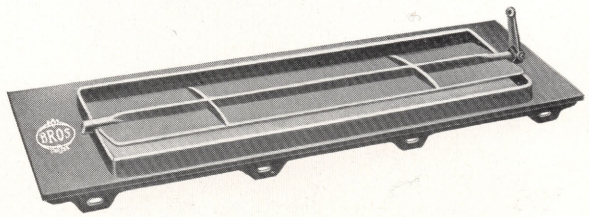
TO EQUIP ONE BOILER

Diameter of Boiler	48	54	60	66	72	78	84
Number of Ribs required	6	7	7	8	9	9	10
Number of No. 2 arch brick	36	42	42	48	54	54	60
Number of straight fire brick	42	49	49	56	63	63	70

Price, per Rib, including suspension and two end tile $10.00
Price of end tile, separate each 1.00

Boiler Castings

Damper and Frame



Diameter of Boiler	Size of Opening	Wt.	Price	Diameter of Boiler	Size of Opening	Wt.	Price
30	10x20	75	$7.00	60	16x43	219	$20.80
36	12x20	80	7.60	66	16x55	262	24.40
42	12x31	115	11.40	72	18x62	311	27.60
48	14x32	161	15.00	78	18x75	366	31.60
54	14x43	198	17.60	84	20x84	470	44.60

Clean Out Door and Frame

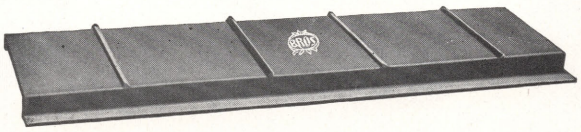
Size	Weight	Price	Size	Weight	Price
*4¾x4¾	8	$ .80	18x16	125	$10.50
7 x7	27	3.40	18x18	88	8.50
12 x6	65	6.50	‡†18x28	251	22.00
‡12x12	80	8.00	20x18	142	12.40
†14x11	23	3.00	‡†24x36	375	34.00
*16x14	79	7.00	‡§36x48	727	50.00

*Not Hinged.
‡Fitted with Register.
†Fitted with Liner.
§Double Doors.
†For Breechings.
Note in all cases horizontal dimension or width is given first.

Rear Bearing Bar

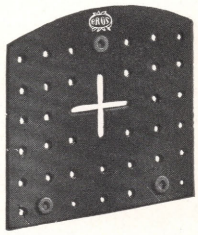
Size of Front	Weight	Price	Size of Front	Weight	Price
30	15	$1.20	60	33	$2.80
36	19	1.60	66	36	3.10
42	23	2.00	72	40	3.50
48	25	2.20	78	43	3.80
54	30	2.50	84	45	4.00

Front Bearing Bars



Diameter Boiler	Dimensions	Weight	Price	Diameter Boiler	Dimensions	Weight	Price
30	13x36	78	$6.60	60	16x66	290	$22.60
36	13x42	94	7.80	66	16x72	317	24.40
42	13x48	111	9.30	72	16x78	320	24.80
48	16x54	230	19.60	78	16x84	360	28.80
54	16x60	271	21.80	84	16x90	484	38.60

Perforated Door Liners



Size of BROS Front	Size of Door	Wt.	Price
30 and 36	17x11¾	17	$1.50
42	20½x13	20	1.70
48, 54, 60 and 66	18x16	23	2.00
72, 78 and 84	20x18	35	3.00

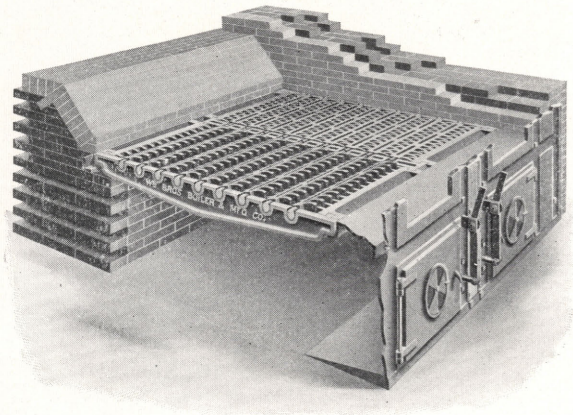
Rear Wall Braces

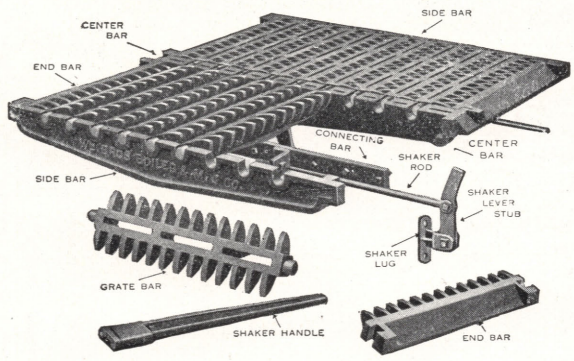
Size Boiler	Distance between outside holes	Distance center hole from end	Weight	Price
30	1′11 ″	.....	13	$1.00
36	2′ 3 ″	.....	15	1.40
42	2′ 7 ″	.....	17	1.70
48	3′ 4½″	.....	48	3.60
54	3′ 6½″	.....	51	4.50
60	3′10½″	.....	55	5.00
66	4′ 0½″	.....	55	5.00
72	5′ 9½″	3′ 3 ″	80	6.40
78	6′ 2 ″	3′ 4½″	84	7.70
84	6′ 8½″	3′ 8 ″	85	8.00

Return Plate

Diameter Boiler	Dimensions	Weight	Price
30	13 x42	66	$5.00
36	14½x48	80	6.00
42	16 x54	112	9.00

Rocking Grates





BROS Rocking Grates are the results of many years of experience building grates for low grade fuel and operating them under actual firing conditions. The design is simple and sturdy. The Grates shake easily and sift out thoroughly all the burned fuel.

All Grates are made in our own foundry and are constructed of heavy grey cast iron, of materials carefully selected to produce a mixture capable of withstanding high temperatures.

Side bars, end bars and center bars are strong and deep to prevent sagging. They are dovetailed together to form a solid, rigid frame for the Grates. Grates have short fingers of heavy cross-sectional area, especially constructed to prevent the loss of unburned fuel. Grates are built either in single sections or double sections. They are operated from the outside.

BROS Grates will burn the cheapest grade of coal, smokelessly and without clinkering. The rocking action of the Grates breaks up any clinker formation into small pieces. No slice bars are necessary to keep a clean, even fire with BROS Rocking Grates.

Fifty per cent air space distributed uniformly over the grate area gives even, clean combustion.

BROS Rocking Grates on test show 10% to 15% saving in the loss of unburned fuel over the average grate.

All BROS Grates are fitted and tested before shipment. Each Grate is numbered on the underside to facilitate replacement.

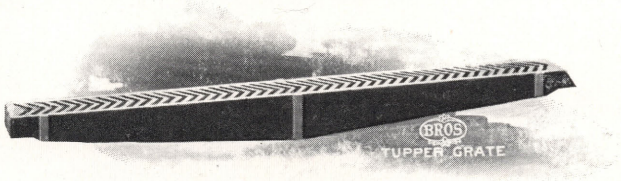
Grates are made in multiple lengths of 6″ and multiple widths of 6″. Any boiler can be fitted with BROS Rocking Grates with very little cost.

Lignite Grates of the same design can be furnished on special orders.

All size Grates are stocked for immediate shipment.

Stationary Grates

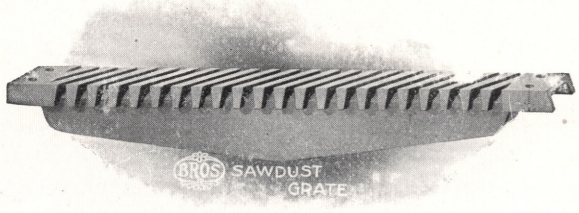
Tupper Grates



Tupper Grates are designed for the burning of coal or wood. They are stocked 6″ wide with ⅜″ and ½″ opening. Lengths are in multiples of six inches.

Price per square foot.....$3.50
Approximate weight per square foot.....55 lbs.

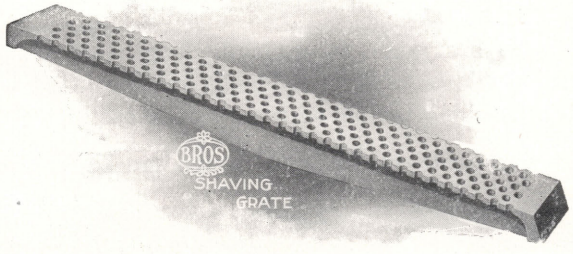
Sawdust Grate



Sawdust Grates are designed for the burning of sawdust. They are stocked 6″ wide with ¼″, ⅜″ and ½″ openings. Lengths are in multiples of six inches.

Price per square foot.....$4.00
Approximate weight per square foot .....65 lbs.

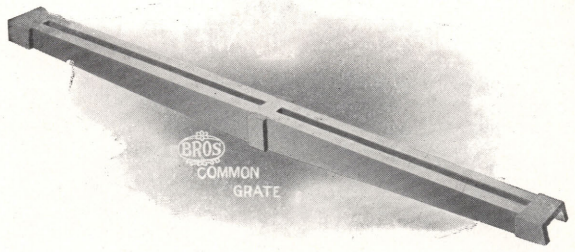
Shaving Grate



Shaving Grates are designed for the burning of shavings. They are stocked 6″ wide. Lengths are in multiples of six inches.

Price per square foot.....$3.00
Approximate weight per square foot.....40 lbs.

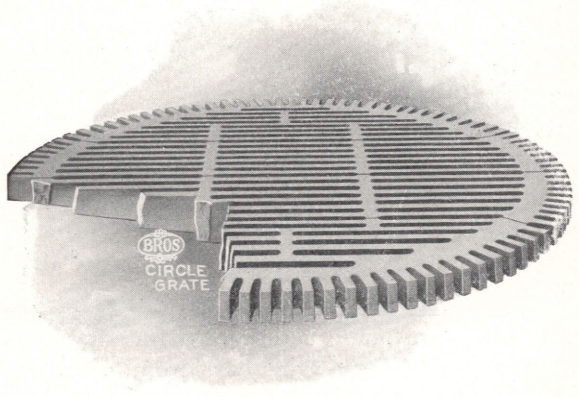
Common Grates



Common Grates can be used for coal or wood. They are stocked in all widths. Lengths are in multiples of six inches.

Price per square foot.....$4.00
Approximate weight per square foot.....70 lbs.

Circular Grates



Circular Grates are made in sections to pass thru the fire doors.

Circular Grates are cast slightly smaller on special order.

Diameter in Inches	No. of Sections	Approx. Wt. per Set	Price Complete
13	2	30	$ 4.00
19½	4	62	5.00
25½	3	141	11.00
28	3	152	12.00
30½	4	186	14.00
*33¼	3	354	24.00
35	4	248	19.00
41	4	390	27.00
46	4	432	30.00
53½	8	960	66.00

*Special.

BROS